THE IRON AGE

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New York, Thursday, April 29, 1909.

THE OHIO MECHANICS INSTITUTE.

A Great Trade School to be Built at Cincinnati.

The Building.

On a historic site in Cincinnati, Ohio, will be built a new home for the Ohio Mechanics Institute, which will at the same time form one of the most complete trade schools in the country. The building will cost $500,000, and is the gift of Mrs. Mary M. Emery, widow of Thomas J. Emery, of Cincinnati. The gift is made with the stipulation that the money is to be used only to pay the cost of construction and not for the equipment of the building, except the seats in the auditorium. This auditorium is to be named Emery Hall, in memory of her husband.

The Ohio Mechanics' Institute, Cincinnati.

The selection of the site for this building, on the corner of Walnut and Canal streets, is considered peculiarly appropriate. Here the old Miles Greenwood foundry, which in its day was one of the most important places west of the Allegheny Mountains, was located. During the Civil War this foundry was converted into an arsenal, made 200 cannon for the Union army, repaired 40,000 rifles and built the steel work for a gunboat. Mr. Greenwood was one of the founders of the Ohio Mechanics Institute, was a leader in the construction of the Cincinnati Southern Railroad, and built up the paid fire department of Cincinnati, of which he was the first chief.

The building will be constructed of reinforced concrete and will be strictly fireproof. The exterior, as shown in the accompanying view, is to be in the modified English Gothic style, and will be composed of brick with stone trimmings. The building will extend 231 ft. on Walnut and Clay streets and 179 ft. on Canal street and an alley. The entire lot will be covered, except a central court, which will be open above the ground floor. The shape of the building will consequently be a hollow rectangle.

The building will be six stories high. The basement will contain the machinery for operating three elevators, the boiler room, fan rooms and forge room and toilet rooms. Plans of the several floors are shown herewith.

The ground floor will have as its most distinctive feature an auditorium built in theater fashion, to seat between 1800 and 1900 persons, and the ceiling of which extends to the third floor. On the same floor will be located the engine room, a plastic work shop and laboratories for testing purposes, including the strength of materials, cement, hydraulic work, &c. The custodian's office will also be located on this floor.

On the first floor are the superintendent's office, the general business offices, the board and faculty room, teachers' room, arts and crafts room (where will be displayed the manufactured articles turned out by the students), five class rooms, lecture room and shop.

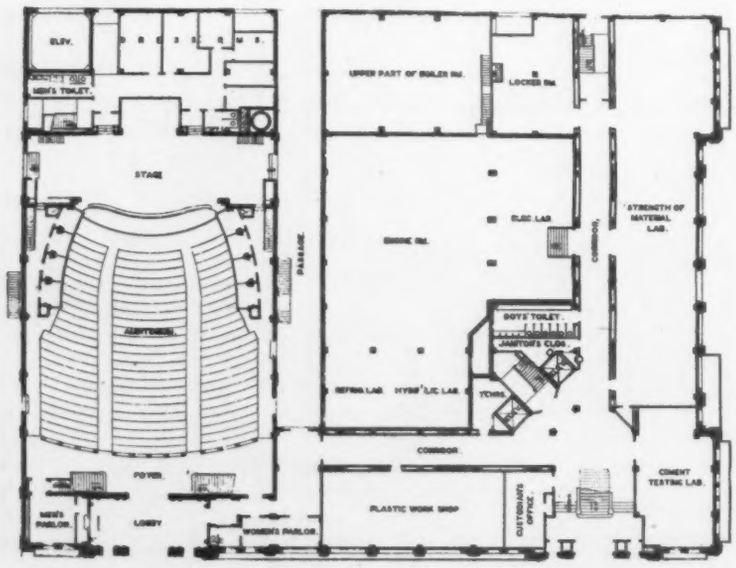
On the second floor are found the museum, library, room for alumni, art gallery, two class rooms and trade school.

On the third floor are the kitchen and dining rooms, domestic science, embroidery, dressmaking and china painting rooms, physical laboratory, lecture room, machine shop and four class rooms.

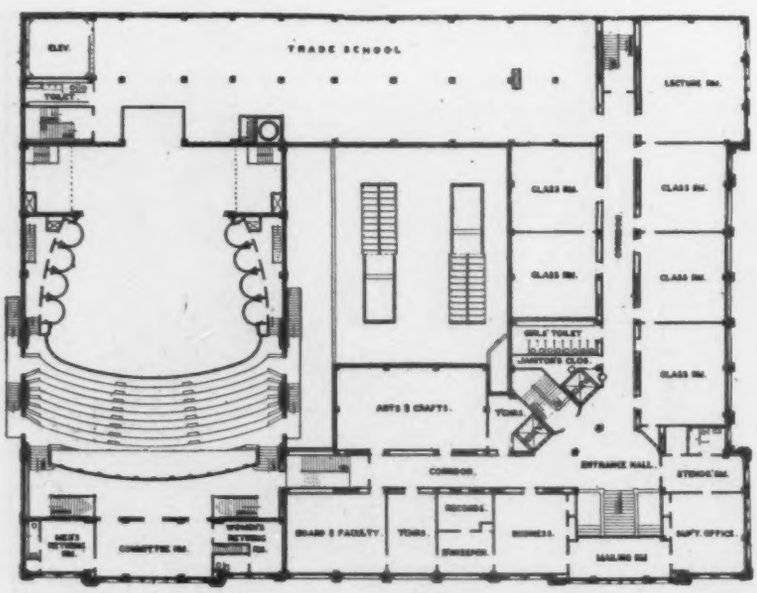
On the fourth floor will be located three mechanical drawing rooms, with model room, lecture room, three class rooms, shop in which will be devoted special attention to the woodworking machines and products, gymnasium both indoor and outdoor, the space over the

auditorium being utilized for the outdoor recreations, boys' and girls' dressing rooms, lockers and rest rooms.

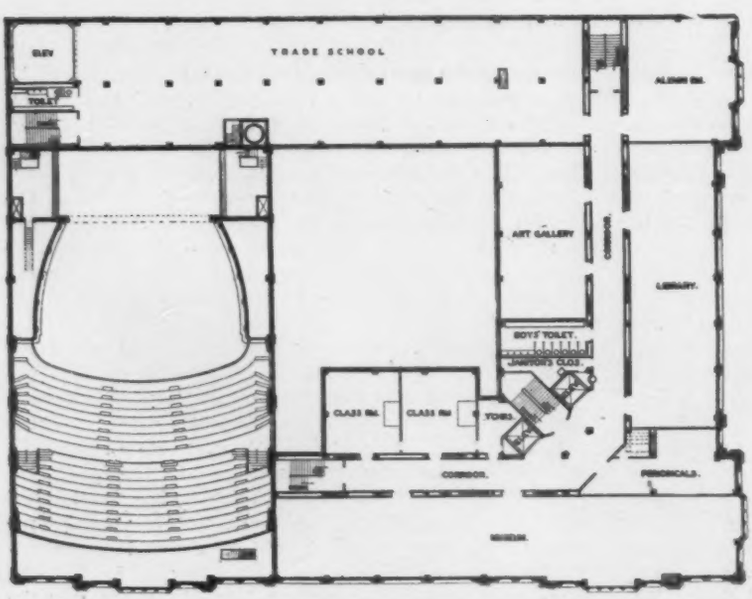
On the fifth floor will be located the chemical laboratory and lecture room, metallurgical laboratory and foundry, two architectural drawing rooms, art room for instruction in free hand drawing, decorative arts, &c., and there will also be a room for life class.



Ground Floor of the Ohio Mechanics' Institute.



First Floor.



Second Floor.

On the roof, or what some would denominate the sixth floor, will be built a complete playground and a conservatory.

The equipment of the machine shop, which will include every modern tool for skilled mechanics, will be furnished by the machine tool builders of Cincinnati and vicinity. It is expected that these tools will, for the most part, be donated; in fact, a number of lathes, planers, drilling machines, shapers, &c., have already been given the enterprise by the Cincinnati Branch of the National Metal Trades Association. It is also hoped that in the new building may be housed a comprehensive display of machine tools and machinery for which Cincinnati is noted, and that it will then be made a show place for working machinery educationally notable.

The work of wrecking the buildings now on the site, the largest of which is the old Greenwood foundry, will begin May 1, and is to be completed in 75 days. By that time the contracts must be let for the construction of the building. The directors of the institute expect to be housed in the new home, which is to be built under the supervision of the architects, Samuel Hannaford & Sons of Cincinnati, by September, 1910. As there is to be no elaboration in the equipping of shops, laboratories and schoolrooms, it is expected that the work of instruction can begin at that time.

The Society.

The Ohio Mechanics Institute, for which the above described structure is to be built, came into being November 20, 1828, and is the fruit of the labors of a group of earnest Cincinnatians who desired that a society might be formed which would undertake the education of young artisans and that class of people in the community upon whom devolved the duty of building up the industries of the city. The application of scientific principles in the rapidly developing production of machinery and labor-saving devices necessitated careful training of the men who were to become the owners and managers of or workmen in the shops and factories of the country. In 1829, on February 9, a charter was issued and the society was legally incorporated under the laws of the State. This charter was amended at the session of the Legislature of 1846-1847. No changes have been made since then in the organic law, and the original purposes of the institution have been rigidly adhered to.

Various discouraging experiences were had in the beginning, unfortunate real estate ventures, &c., but the society held regular meetings for the discussion of important technical subjects and to bring out various scientific principles that came gradually into use. Lectures on chemistry and physics received careful attention; the general use of the steam engine with the many improvements that were made at that time formed a fruitful topic. The engineering principles connected with early railroad construction and the locomotive and the various rapidly developing railroad appliances gave opportunity to the young mechanic to invent, study and put into practical use many new and important elements for the rapid growth of industrial life.

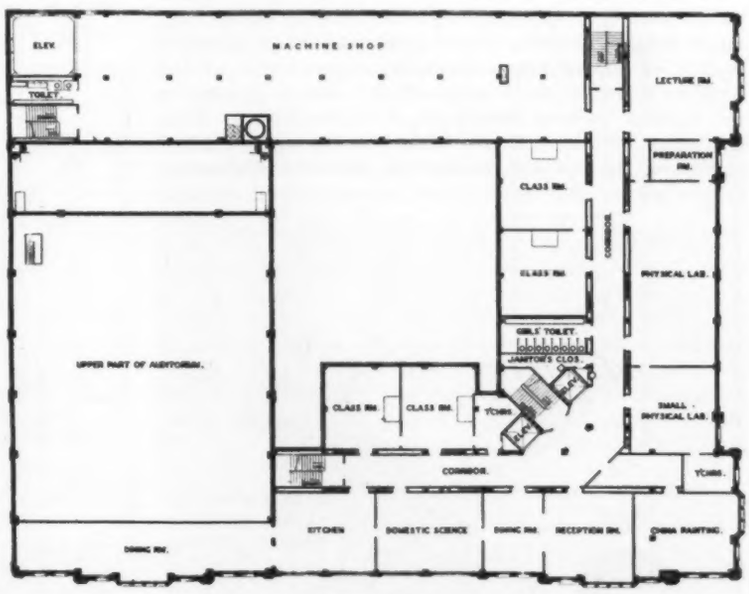
A library was provided shortly after the organization of the society, and the membership greatly increased to obtain library facilities. In 1837 an industrial exhibition was organized, and the foundation was laid for one of the most important factors that contributed to the development of American industry. The various world's fairs—Chicago, St. Louis, Buffalo, and others in the interior States—were, in a great measure, the outcome of the many exhibitions maintained by the people of Cincinnati under the management of the Ohio Mechanics Institute. These exhibitions were continued almost annually until the breaking out of the Civil War, increasing in size and importance from year to year. Beginning with 1870 fourteen annual exhibitions were held, closing with the Centennial Exposition of the Ohio Valley. In all these undertakings the institute was pre-eminent. Beginning with 1856-1857, the night school was established and systematic instruction was imparted in mechanical, architectural and free hand drawing. The night school is still the great feature of the work, men in all parts of the country acknowledge this old school as their alma mater and inspiration.

The building in which the work is carried on at present, on the corner of Sixth and Vine streets, was erected in 1848, the corner stone having been laid on July 4 of that year. The necessary amount was raised in gifts from 25 cents to $10,000. The name of Miles Greenwood, to whom special credit is due for making this project possible, will never be forgotten by those prominent in Ohio Mechanics' Institute affairs.

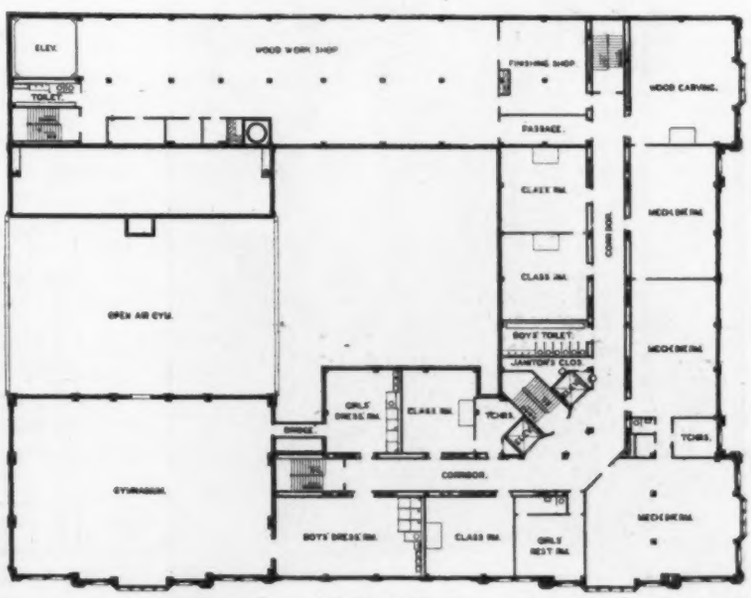
All this educational work has been carried on without any burden to the taxpayers of Cincinnati. The tuition has always been low; so low that many regarded it as practically free. In 1900 it was determined that the building should be reconstructed, and two complete stories were added. The necessity for more room grew more and more apparent from year to year, until at the time when Mrs. Emery's splendid gift was announced the directors were about ready to despair. During the year 1904 there were 1393 students added, and since then the growth has been remarkable. The present officers of the institution are as follows:

President, Walter Laidlaw, Laidlaw-Dunn-Gordon Company; vice-president, Perrin G. March, Cincinnati Shaper Company; treasurer, Harvey E. Hannaford, Samuel Hannaford & Sons; secretary, Harry T. Atkins, Atkins & Pearce Mfg. Company. Directors: The foregoing and Fred A. Geier, Cincinnati Milling Machine Company; William Lodge, Lodge & Shipley Machine Tool Company; James C. Hobart, Triumph Electric Company; John M. Hubbell, Dr. John C. Kunz, William Attlesey, Wm. Attlesey Plumbing Company; Judge Charles J. Hunt, Court of Common Pleas, Cincinnati.

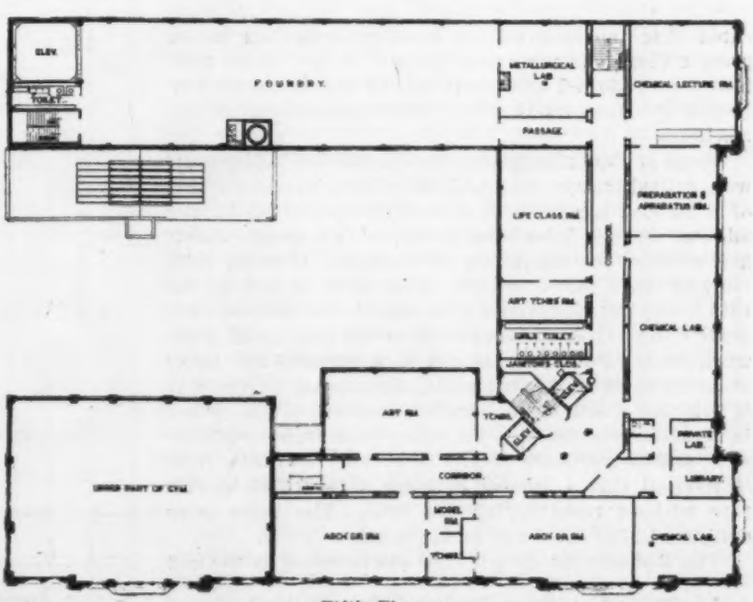
Plans for a new plant to be established by the Central Oakland Light & Power Company, Oakland, Cal., are now in the hands of the engineers. The project involves an expenditure estimated at about $300,000. The initial installation of machinery is designed to have a capacity of 3000 hp., provision being made for an increase to 20,000 hp. as future needs develop. The contract will call for the completion of the structure in time to have everything in readiness to furnish light and power by October 1.



Third Floor.



Fourth Floor.



Fifth Floor.

High Speed Drilling Tests.

BY GEO. E. HALLENBECK.*

The accompanying diagrams show the results of tests made with high speed drills on a Baker Brothers high speed drilling machine, shown in Fig. 1. They represent a part of the experiments made at the works of the builders to determine the most efficient design of machine for driving medium size drills—*i. e.*, from ¾ to 2 in. Among other things, it was desired to know the vertical thrust on the spindle in order to properly design the thrust bearing and feeding mechanism; experience indicated that the load on the feeding mechanism is far greater than it is commonly thought to be. These tests have been followed up closely and the improvements suggested by their study have been incorporated in the machines.

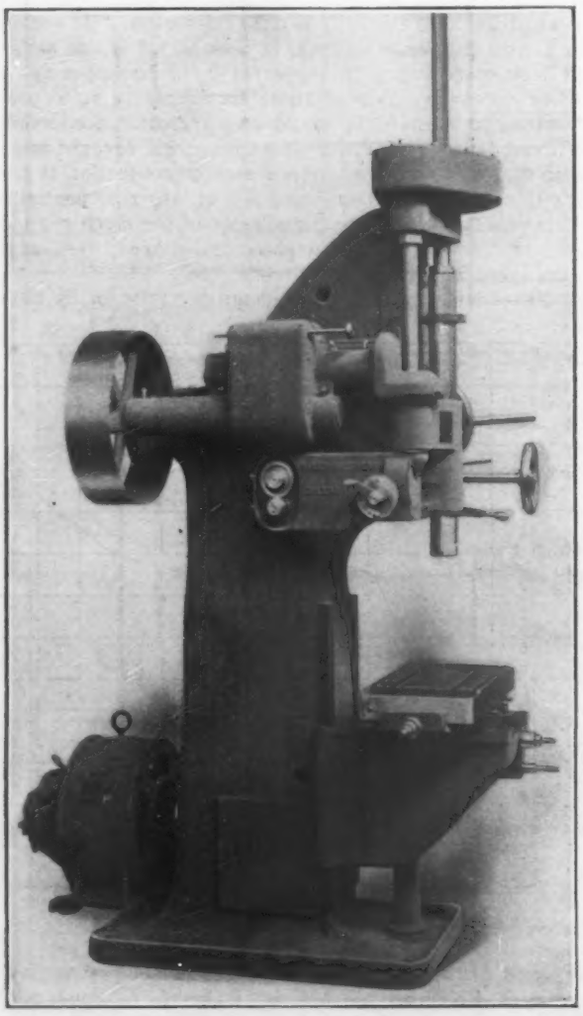


Fig. 1.—The Baker High Speed Drill on Which the Tests Were Made.

Some of the drilling done is remarkable; 1⅛-in. holes were drilled through 4¼-in. blocks of cast iron at the rate of 8 2-3 sec. per hole, or a vertical feed of 29 in. per minute. Several holes were drilled at this speed without necessitating the regrinding of the drill. Through ¾-in. machine steel plate, 15-16-in. holes were drilled at the rate of 3½ sec. each, and a great many similar tests were made. When it is considered that the average punch press when punching 15-16-in. holes in ¾-in. material will make about 20 to 30 strokes a minute, or, in other words, that it will take 2 to 3 sec. to punch a hole which was drilled in these tests in 3½ sec., the really remarkable performance stands out more clearly, especially so when it is understood that a number of holes were drilled at this rate without resharpening the drill. The holes were drilled without lubricant of any kind.

Fig. 2 shows the variation of the pressure on the end of a 1¼-in. drill in relation to a gradually increasing rate of feed. Several tests are shown at speeds varying from 80 to 450 rev. per min. The conditions of these tests were such that only general conclusions can be drawn from the curves. One deduction from Fig. 2 is that the effect of increasing the feed is to increase the pressure on the drill point in a straight line ratio, although the

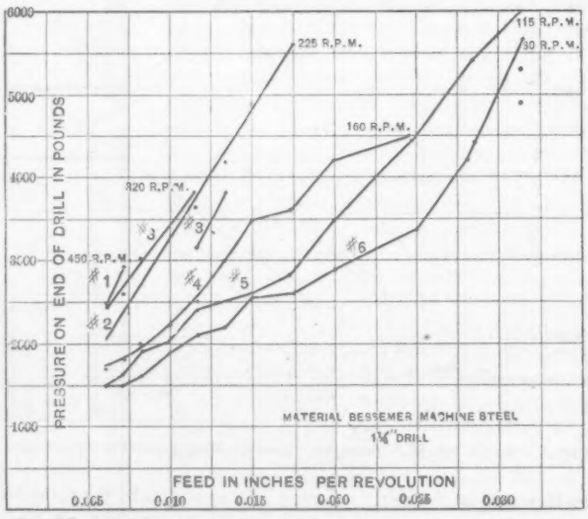


Fig. 2.—Showing Variation of Pressure on the Drill with Increasing Feed.

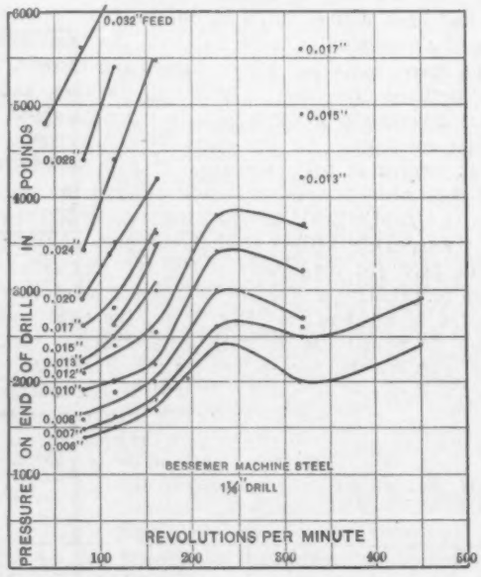


Fig. 3.—Curves with Feed Constant and Speed Variable.

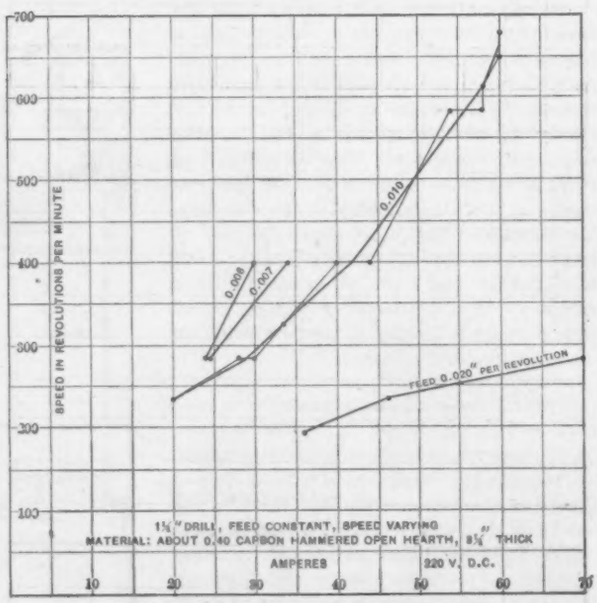


Fig. 4.—Power Required at Different Speeds.

* Superintendent, Baker Brothers, Toledo, Ohio.

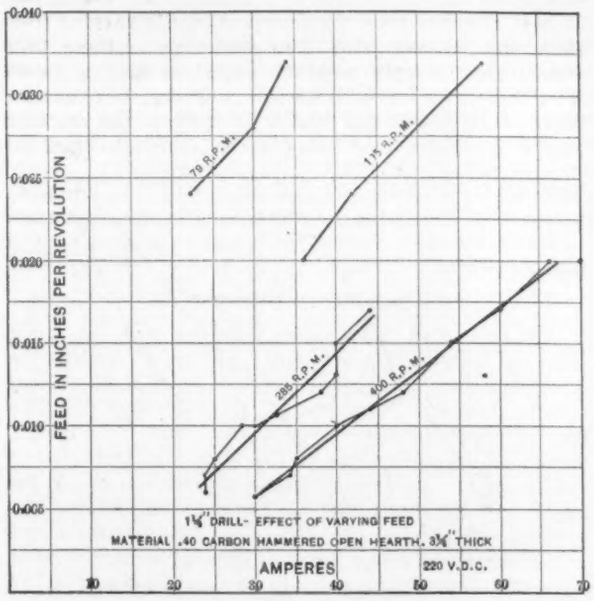


Fig. 5.—Variation in Power at Constant Speed and Varying Feed.

tests made at 80 rev. per min. would indicate that there was a tendency toward an increasing pressure as the feed was increased. No great variation in the vertical thrust with the increasing depth of hole after the first ¼ in. had been drilled could be observed.

Fig. 3 shows similar tests, but with the feed constant and the speed variable. These curves and those of Fig. 6 are perhaps the most interesting, as they show a peculiar decrease in pressure by increasing the speed with the feed constant. All the tests show practically the same in regard to this decrease. It will be seen from Fig. 3 that while it was impossible to drill the material used with a feed of 0.013 in. per revolution at 225 rev. per min., it was easily drilled at that and even at 0.015 and 0.017 in. feed per revolution at 320 rev. per min. The relation of pressure to feed in inches per revolution was attempted to be shown on Fig. 7, but the data was not sufficient to render the diagram satisfactory.

Fig. 4 shows the horsepower consumed and its variation with variation in speed. It will be noticed that at the fine feeds—*i. e.*, feeds of under 0.01 in. per revolution—the amount of power increases in a decreasing ratio as the speed increases, whereas at a feed of 0.02 in. per revolution just the opposite seems to be true. The amperes readings shown on the diagram represent the total electrical input into the motor, no corrections having been made for either the losses in the motor or in the machine itself, as the data desired was the amount of power which will have to be delivered to the machine. Tests were made of both the motor and machine, showing them to be very efficient.

Fig. 5 shows the variation in power required under a constant speed with varying feed. The increase in power consumption is apparently a constant ratio.

Fig. 6 shows the remarkable increase in production possible by increasing the speed. The curves are plotted, showing the maximum feed at which the stock was successfully drilled without destroying the drill; with the next higher feed the drill would be destroyed. To secure as nearly uniform conditions as possible all of one series of tests were run with the same drill, resharpening it when necessary. One of these curves shows quite conclusively that the drill would give a greater production without failing at 200 than it would at 250 rev. per min., also that it would give a much greater production if the speed were still further increased to 440 rev. per min. This may be an index to the solution of the much mooted question of whether a slow speed and a heavy feed or a high speed and fine feed is preferable.

These tests on drilling, although involving many hundreds of drilled holes, are not offered as conclusive, having been altogether too few in number to establish permanently the conclusions to which a study of the diagrams naturally leads. Yet they seem to indicate quite strongly that the best results will be obtained at comparatively high speeds and moderate feeds, it being possible to carry a heavier feed at a high speed than at a medium speed. This being repeatedly evident in the tests led to making the series of which results are shown in Fig. 6 to demonstrate whether such was actually the case or whether the apparent decrease was due to other causes.

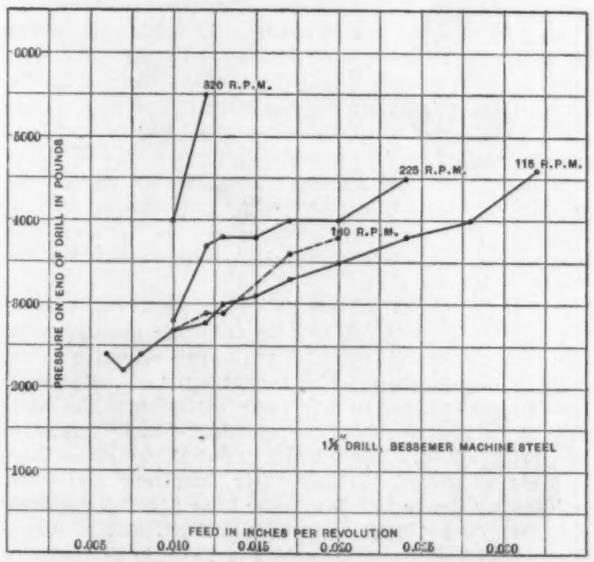


Fig. 7.—Relation of Pressure to Feed Per Revolution.

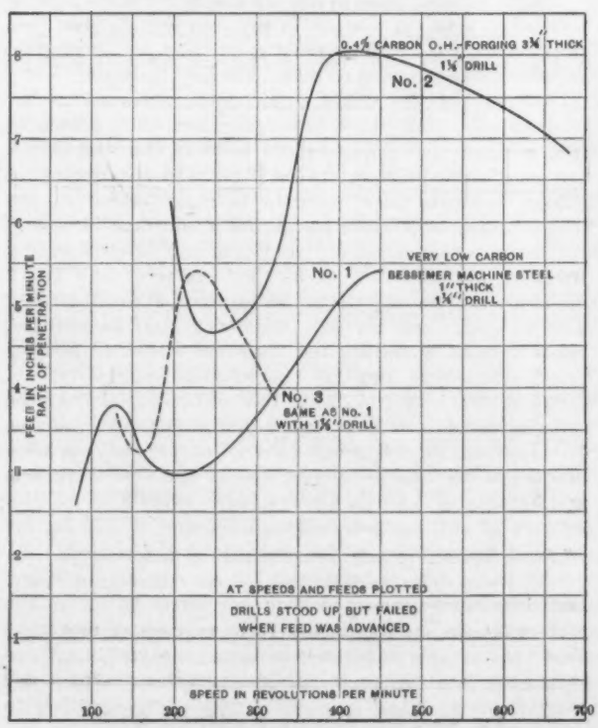


Fig. 6.—Maximum Possible Feeds at Different Speeds.

Most of the drilling was done with a 1¼-in. drill which had to be resharpened very few times, showing that although the majority of the tests could not have been made on many other machines, at the same time they were all well within reason. The machine on which these tests were made, shown in Fig. 1, is driven by a 4-to-1 variable speed motor and has a speed of from 70 to 700 rev. per min. By providing suitable gearing a wide range of feeds between 0.006 and 0.032 in. per revolution is secured. The machine was provided with roller bearings, but otherwise was the regular high speed drill as now built by Baker Brothers.

The Chicago office of the Carpenter Steel Company, Reading, Pa., has been moved from the Western Union Building to the Commercial National Bank Building. Russell Dale, formerly sales manager for the Celfor Tool Company, is now manager of the Western office.

Firebrick for Blast Furnaces.

Defects Which Shorten the Life of Linings.

BY A BLAST FURNACE SUPERINTENDENT.

One of the inevitable results of the business depression of the past 15 months has been the demand for better goods and better service. The restricted market for both labor and materials has enabled buyers to ask and to get goods that came nearer to the desired specifications than was possible during the prosperous times just previous to the fall of 1907. This has been especially noticeable in all branches of the iron and steel industry. The enforced shutting down of many mills and furnaces gave ample time for needed renewals and extensions. Relieved of the rush of making repairs during full operation, managers have had a chance to reject materials that were not up to specifications, with no risk of loss on account of delay. Such an opportunity has afforded closer observation of the character of firebrick for blast furnace linings.

It has often been the case that the firebrick lining would be bought, made, shipped and laid in the furnace in the least possible time, without opportunity for close inspection and rigid adherence to the specifications. This condition has been harmful to the brick manufacturer as well as to the furnace owners. In many cases there has not been a careful and detailed specification on the part of the purchaser, but too often it has been a case of a rush order of so many brick of certain sizes and shapes, and of certain well-known brands, and of standard dimensions and quality. There is not yet a close enough understanding between the furnacemen and the brickmen, especially on the seriousness of the seemingly slight defects in the composition, the dimensions and the shape of the firebrick.

It is the object of this article to point out some of the defects of firebrick as seen from the standpoint of the blast furnace superintendent; to call attention to the need of closer agreement as to standards of composition and dimensions, and to urge closer attention to the small points in manufacture, the seemingly little things in the brick works. The leading firebrick companies have already expressed through their literature and their salesmen a desire to produce the kind of brick required, but they do not wish to incur additional cost of manufacture without a corresponding increase in the price of their brick or an increase in volume of business. The defects most common in blast furnace firebrick are irregularities in names, dimensions and composition; crookedness in shape, and lack of uniform burning.

Irregularity in Names.

The majority of blast furnace linings are made up of 9 and 13½ in. shapes, with the base sizes of 9 x 4½ x 2½ and 13½ x 6 x 2½ in. brick. The manufacturers are fairly well agreed as to the names and numbers of the various sizes and shapes, but still there is some confusion, especially in the naming of the keys and side arch brick. What one manufacturer calls a No. 1 key or a No. 1 arch brick may be called by some other maker a No. 2 brick; and some makers call a No. 2 key what others call a No. 4. All brick of the same dimensions should have the same trade number, so as to avoid confusion in ordering and in handling. As long as there exists any uncertainty on this point the buyer in ordering should give all dimensions of each kind and size of brick after the name of the brick.

Although it is advantageous to both the manufacturer and to the user to have the brand name on every brick, it is not safe to rely wholly on the trade names to designate to what parts of the furnace lining the different brick belong. It is much better all around to have the words "hearth and bosh," "inwall," or "top" on each brick in addition to the name of the brand or the initials of the manufacturer. To have the kind of key or arch brick indicated by stamping its number on each brick is also a great help in handling the brick from the kiln to the furnace lining.

Having the name of the part of the furnace for which each brick is made stamped on the brick is a great help and prevents confusion during the actual work of lining the furnace. The "hearth and bosh" brick are not likely to be confused with the "inwall" brick or with the "top" brick, and brick with any of these names on them would not be put into a hot blast stove. Where different trade names are used on the brick to designate the part of the lining to which they belong, there are just so many more chances for mistakes in handling and laying the brick.

Irregularity in Dimensions.

The matter of exact dimensions has been too much neglected by all concerned, partly because of carelessness in manufacture and partly because of lack of remonstrance from the furnaceman. It is possible that the furnace superintendent does not know that these irregularities in the dimensions of the brick will increase the cost of laying, and will indirectly shorten the life of the lining. It is possible that the terms of the contract for relining the furnace are such that these irregularities will make more money for the bricklayer, but in most cases the bricklayer is eager to do a good job and to lay the brick with least expense and most lasting results. It is possible, too, that the brick makers do not realize that these variations in dimensions make any difference in the cost and life of the lining.

In laying a wall of 9 in. and 13½ in. brick, it is essential that all the 9 in. squares, keys, arch brick, wedges, &c., be practically 9 in. long and 2½ in. thick, otherwise there can be no even courses or bonds. And if the 13½-in. brick are not just 13½ in. long and 2½ in. thick the irregularities of the wall are even more exaggerated. Instead of brick being 9 in. long they will vary from 8⅜ to 9¼ in. long, and a 13½-in. brick is likely to be 13⅛ in. long, and in some few cases it may be 13⅝ in. long. Differences in the thickness of brick are not so common, but they sometimes occur. In one instance the names of the brand and manufacturer stood out 3-32 in. from the surface of the brick because the die plate was not properly adjusted in the press. Such a defect could cause a crack of 3-16 in. between two brick if the stamped sides were laid facing each other.

The front rows of brick are generally laid to a sweep, and if the keys are different length from the squares there will be irregular vertical cracks between the front row and the next row. The cracks are usually filled with the very thin fireclay, but when the wall is thoroughly dried out cavities will form, and these will eventually give the furnace gases a chance to work through the wall.

These irregularities in dimensions increase the cost of laying the brick unless one is satisfied with a poor job. If the brick need much trimming the cost for extra time of bricklayers amounts to about $10 per thousand.

Besides getting rather unsatisfactory results at increased labor cost, there is another serious objection to this irregularity in dimensions because the dimensions are nearly always short. There is actually a deficiency of cubical contents that amounts to considerable in the whole lining, in some cases giving a shortage of 4 to 8 per cent. This is easily and quickly determined by weighing the cars of brick as they are received. The 9 in. squares from one large manufacturer weighed only 6.88 lb. each, and the 9-in. keys only 6.60 lb. a piece. From another manufacturer the brick were full or over in all dimensions, and the 9-in. squares weighed 7.87 lb. each and the 9-in. keys 7.31 lb. In some cases brick from the same manufacturer vary ¾ lb. in the same 9-in. shape. This shortage in weight and cubical contents is even more marked in the 13½-in. shapes, and in one case there was a difference of 1.60 lb. between the weights of 13½-in. squares of two makers, and a difference of 1.75 lb. between different brick of the same make and shape.

All these defects show lack of care in manufacture, and they can be remedied if proper stress is put on the matter by the management. It is generally understood that "the making of brick is a very crude art," but there is too much at stake to continue making firebrick for blast furnace linings without giving more attention to exact composition and exact dimensions.

Irregularities in Shape.

Another very common defect in firebrick is the curvature in the 9 and 13½-in. brick. This amounts to 1-16 in. up to ⅜ in., and is mostly in the brick that are stamped on one side. The convex side is invariably the surface that has the name of the brand or of the maker stamped on it. In laying such brick the bricklayer usually puts the convex side up and "breaks its back" with a hammer to make it lie flat, thus weakening the wall and adding another gas crack.

All brick that show a curvature of more than ⅛ in. when tried with a straight edge should be rejected, as it is impossible to get a good wall with curved brick. In some cases these curved brick have been trimmed and used, but this is putting loss of time and heavy expense on the furnaceman, and the result is not as satisfactory as when full sized straight brick are used.

To avoid this curvature some manufacturers advocate making the brick 3 in. thick instead of 2½ in. Doubtless this would help to make a straighter brick, but if more care were taken in repressing and on the drying floor, there would not be so many defective brick on this account.

Irregularity in Burning.

All the brick that are intended for the same part of the furnace should have practically the same amount of burning and the same degree of hardness. This is especially important for the brick that go in the top lining of a furnace where abrasion and the action of gas so readily destroy the brick work. In all cases the brick should be burned hard enough to "show up" all the iron particles. Although the brickmakers and the users know the above facts, it is often the case that brick for the same part of the furnace will be burned in different parts of the same kiln and under different conditions, so as to complete and ship the whole lining in the least possible time. This is bad practice, and especially so with reference to brick that are to go into the top of the furnace.

Remedies for Defects.

There should be no great trouble in overcoming all the above mentioned irregularities, and it is evidently the desire of the manufacturers to produce brick that are acceptable. It is also evident that there has been no very serious objection on the part of the furnacemen to the irregularities that have become, through long usage, characteristic of blast furnace fire brick. Why should we any longer be subjected to the "additional 10 per cent. to make up for breakage," when there would be no need of adding such an amount to our estimate if all the brick were fully 9 x 4½ x 2½ in., or any other specified dimensions? Fire brick are so well handled and shipped that there is scarcely any breakage. There should be no occasion to "run short" of 9-in. squares just because the side arch brick were not of proper dimensions, and more squares were used than was calculated. If brick were true to the specified dimensions it would be very easy to calculate the number of each kind required.

The evils of curved brick, warped brick and off-size brick can be remedied by the manufacturers by closer attention to the stiffness of the clay mixture, the molding, drying, pressing and burning. The dies and presses will wear out and will change in dimensions, and it becomes necessary to check up the measurements occasionally in order to guard against uneven brick. The shrinkage in drying and burning can be governed so that the finished brick is true to its name and specifications. The trimming of uneven brick by high priced bricklayers under hurry-up conditions is not only very expensive, but the scutching off of the "skin" of the brick greatly reduces their wearing qaulities and hastens their destruction.

Conclusions.

In ordering firebrick for a blast furnace lining, the following points should be followed:

1. There should be a distinct understanding between the purchaser and the seller as to the dimensions and names of each kind and shape of brick, and in writing the order the full dimensions should follow the name of each kind of brick ordered.

2. All brick varying more than ⅛ in. from the specified dimensions and all brick curved more than ⅛ in. from a flat surface are to be rejected.

3. Samples of each kind of brick are to be submitted and kept for comparison with the shipments.

4. The lining should be made as fast as possible and shipped direct to the furnace, so as to avoid irregularities caused by changes in molds, presses and mixture.

5. The mixture for each quality of brick should be watched to see that the materials are properly proportioned.

Steel Sheet Piling.

In a pamphlet of 64 pages, 8 x 10 in., the Carnegie Steel Company makes an impressive showing of the increasing use of steel sheet piling. Special attention is directed to notable pieces of engineering work in which United States steel sheet piling has been used in the 18 months since the original pamphlet was issued. The evolution of the sheet piling industry in the United States is traced from the driving of six experimental units of interlocking channel bar piling by L. P. Friestedt in Chicago in June, 1899. A later development was the symmetrical interlock which gives a very strong and stiff piling. The United States piling is manufactured under the patent of Samuel K. Behrend, in three weights, the Friestedt interlocking channel bar piling in four and the symmetrical interlock channel bar piling in six. Two cases are mentioned in which steel sheet piling was cut on the ground, in one instance the electric arc being used and in the other the oxyacetylene method.

A large number of full page illustrations appear, showing cofferdams and trench work, lock construction, retaining walls, mine shafts, sea walls, caissons, &c., in which the later types of piling have been employed effectively. Interesting data are given as to the reuse of steel piling and the economies possible in this way. It is stated that a number of foundries employ steel sheet piling for curbing. One foundry at East Chicago, Ill., is using 12-in., 35-lb. United States steel sheet piling 16-in. long for all large castings, especially heavy cylinders. The piling is assembled in a square or cylindrical shape. One tier can be built as high as is necessary, running in some cases up to 10 ft., breaking joints alternately. Cast iron sections used for this purpose, it is stated, need to be twice as heavy in order to have the same resistance as steel, the economy consisting not only in the smaller cost but also in the lighter weight.

"Open Shop" Stove Foundries.—In a bulletin issued by the National Founders' Association under date of April 21 particulars are given of strikes in stove foundries located at Brantford, Weston and Hamilton, Ont.; Belleville, Ill.; Fremont, Ohio; Sheffield, Ala.; Youngstown, Ohio; Columbus, Miss.; Gadsden, Ala., and Louisville, Ky. In two cases the firms yielded to the union. At Columbus, Miss., the foundry was closed. The strikes in the Ontario cities, in Sheffield, Youngstown, Gadsden and Louisville resulted in the employment of nonunion men, and in all these cases open shops are now being maintained. The bulletin contains also a partial list of open shop stove foundries in the United States and Canada. It is explained that the list contains no names of shops that are only theoretically open. Of the shops mentioned 9 are in Alabama, 1 each in Georgia, Indiana, Michigan, Missouri, Pennsylvania and West Virginia, 4 in Kentucky, 6 in Ohio, 7 in Tennessee and 8 in Ontario, Canada. The statement is made that "stove foundrymen throughout the United States and Canada are now beginning to realize that the agreement entered into by the Stove Founders' National Defense Association and the Iron Molders' Union, which gives the union complete control of the machine, will never permit the development of this appliance as it should be."

The Indianapolis Switch & Frog Company announces the appointment of J. A. Foulks as Eastern representative, with offices at 29 Broadway, New York. The company manufactures frogs, switches, crossings and special track material for steam and electric railroads, also industrial, mining and smelter tracks.

The Fosdick No. 0 Horizontal Boring, Drilling and Milling Machine.

Fig. 1 shows a No. 0 horizontal boring, drilling and milling machine equipped with speed box and constant speed motor, as built by the Fosdick Machine Tool Company, Cincinnati, Ohio. The speed box used is of the tumbler gear type and is equipped with steel gears throughout. There are four changes made through the tumbler gears and two changes through the back gears

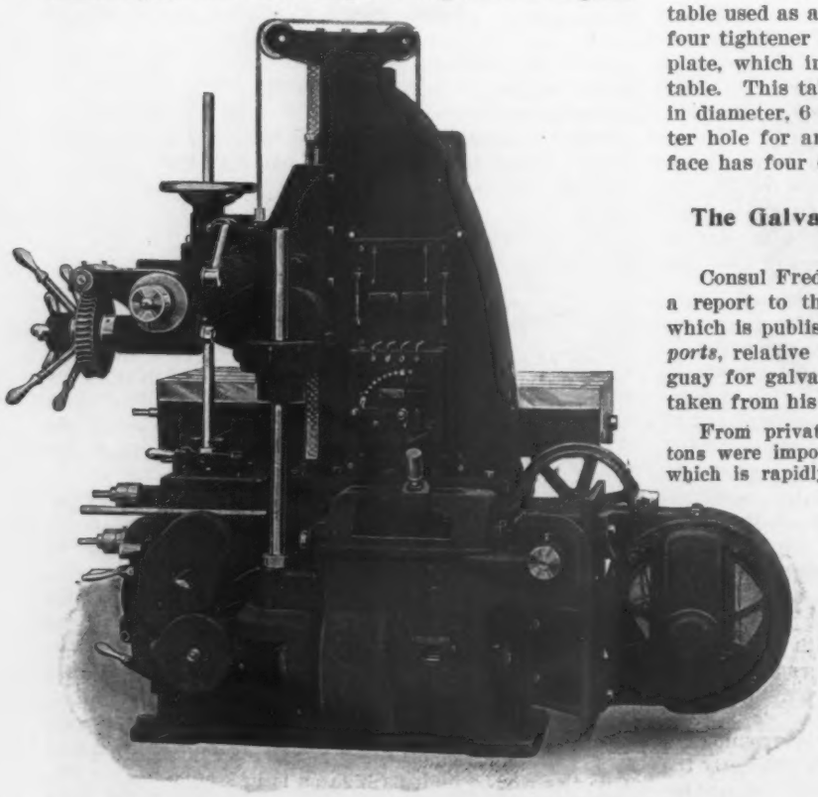


Fig. 1.—The No. 0 Horizontal Boring, Drilling and Milling Machine Built by the Fosdick Machine Tool Company, Cincinnati, Ohio.

in the speed box, making a total of eight changes of speed. The slow speed change is made through a pair of tool steel clutches 4 in. in diameter, and the high speed change through a powerful friction clutch 5½ in. in diameter. These changes are controlled by a lever at the front of the machine, which can also be used to entirely stop the machine. A 5-hp. constant speed motor running at 1000 rev. per min. is used, geared direct to the driving shaft through a pair of spur gears, the pinion of which is of rawhide, brass bound.

When a variable speed motor is used the equipment is similar to that shown, with the exception of the speed box and controller. A drum type controller is used and is mounted on the head, where the speeds can be easily controlled from the front of the machine. The lever for starting, stopping or back gear changes is in the same position as shown for the constant speed drive.

Fig. 2 shows a revolving table, an auxiliary table and a star feed facing attachment for use on this machine. The star feed facing attachment is used for facing work up to 18 in. in diameter, and can be bolted direct to the spindle sleeve or securely clamped in any position on the spindle. The auxiliary table is used for any overhanging work, which can either be bolted to it or travel on it. It is 8 in. wide and 48 in. long, and has T slots its entire length. The revolving table shown is a combination hand swiveling and worm swiveling table. The worm with its hand wheel can be withdrawn and the table used as a plain revolving table. The top platen has four tightener bolts, which securely fasten it to the base plate, which in turn is tongued and bolted to the cross table. This table is graduated to half degrees, is 24 in. in diameter, 6 in. high, and has an accurately bored center hole for arbors or plugs as required. The top surface has four cored T slots.

The Galvanized Sheet Trade of Uruguay.

Consul Frederick W. Goding of Montevideo has made a report to the Department of Commerce and Labor, which is published in the *Daily Consular and Trade Reports*, relative to the large and growing demand in Uruguay for galvanized sheets. The following extracts are taken from his report:

From private sources it is learned that about 100,000 tons were imported into Uruguay in 1908. Of this trade, which is rapidly growing, 95 per cent. is in the hands of British merchants, for the reason that, having representatives on the spot, the need for the material was foreseen and provided for by them. The first shipment of 50 tons from the United States was made at the time of the opening of direct communications with Montevideo, and sold well, proving in every way equal to the British product.

All the importers of galvanized iron here were interviewed and they agree that the trade is growing, soon to reach enormous proportions, owing to its rapidly increasing use as a material for roofs, buildings, bathtubs, buckets, &c. The reasons given for not purchasing in the United States were on account of a lack of knowledge of the American article, the 5 to 10 per cent. higher prices, the more costly transportation, and the quotations being f.o.b. Montevideo, whereas they should be f.o.b. at the loading port in the United States, allowing the purchaser to obtain the best freight terms. They all call attention to the better communications with Great Britain, stating that that alone encouraged trade, the lack of which lessened the chances of competing nations.

The sizes most commonly used here are 3 x 6 ft., both corrugated and plain, although other sizes are always kept in stock. The duties and charges here are $92.63 per ton of 2000 lb., which includes all of the additional minor duties and charges.

The information given is of interest to American manufacturers. The report, however, greatly overestimates the quantity of galvanized sheets now used in Uruguay. British trade returns put the monthly exports of such sheets to Uruguay at about 900 tons. The annual consumption therefore is far under the 100,000 tons above named.

Fig. 2.—Attachments for the Fosdick No. 0 Horizontal Boring, Drilling and Milling Machine.

Graham Pressed Steel Grinder Chucks.

Chucks for holding abrasive material, principally intended for use on disk grinders but adapted to any machine using the face of its wheel for doing the cutting, are a new product of the Graham Mfg. Company, Providence, R. I. They are made in sizes from 9 to 30 in. outside diameter of the grinding rings (not the outside of the holder). The sizes generally used on disk grinders, in place of the disks, are the 12, 15 and 18 in. chucks. One of the best features of the construction is that the total diameter of the chuck is but comparatively little larger

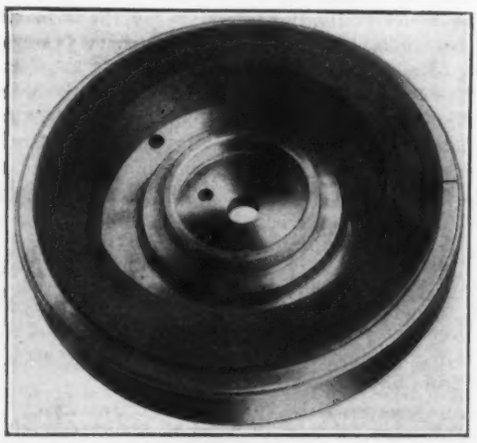


Fig. 1.—A Pressed Steel Chuck for Holding Grinding Rings, Made by the Graham Mfg. Company, Providence, R. I.

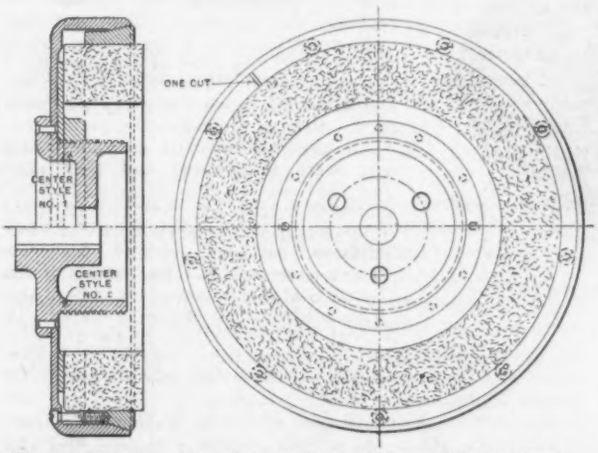


Fig. 2.—Details of the Graham Pressed Steel Grinder Chuck.

than the grinding ring itself, and was one of the principal objects in its manufacture.

The material of the main portion, or body, of the chuck is pressed steel, machined and finished all over. This makes a very light construction, which is desirable, as it is a waste of power to revolve unnecessary weight at high speed. In addition to lightness, it is also necessary to have strength sufficient for safety. Cast iron should not be used, though, barring accidents, it would probably be sufficiently strong to take care of all the mechanical and generated outward forces. Steel castings would answer, but they are less reliable on account of blowholes and often require excessive machining due to bad gates, lumps and sand.

The body of the chuck is fastened by a large number of small rivets to the center, the idea being to reduce any chance of straining the metals through which they pass. The center is made to suit any style of spindle; two commonly used are shown in the sectional view, Fig. 2. The No. 1 style is that used on disk grinders and the No. 2 on all kinds of face grinders, such as knife grinders, safe plate grinders, guide bar grinders and many others for specific uses. The same casting that forms the center extends inside and is threaded to take a setting-out nut, which acts as a backing for the grinding ring as well as providing adjustment for wear. The nut is moved by a straddle wrench, with two pins to engage holes in the hub, plainly shown in Fig. 1.

The clamping arrangement consists of a split ring drawn into a taper bearing, or large cone, by numerous screws from behind. The ring is split at one place only, which has been found sufficient, though there is no reason why more cuts could not be made if desired. This method gives a powerful and satisfactory grip.

The greatest field for these chucks is on disk grinders on which emery cloth has been used and found either too expensive or where considerable stock has to be removed and emery cloth will not stand up to the work. In general design they have worked out very satisfactorily. The outside is practically smooth, which is a good feature, as an irregular periphery is a constant source of danger on such high speed revolving devices. The inside is such as makes them readily adaptable to different styles or special spindles, as well as the whole being easily understood and adjusted. Chucks for holding segments of abrasives are sometimes called for and the company has devised a method for holding them.

Machine Tracklayers.

A variety of machine tracklayers are being used by the railroads. These devices do not actually lay the track, but facilitate the delivery of ties and rails at the head of a construction train. The Harris system is one of the oldest. The ties are conveyed to the front by a train running on a narrow gauge track laid on top of the cars. A loading machine deposits a load of ties on the small cars, which are run forward by hand, and at the front are automatically dumped. The rails, carried on forward cars, are run to the front on dead rollers set between the rails of the narrow gauge track, and an attachment forward handles the rails.

The Hurley tracklaying device operates under its own steam, dispensing with a locomotive. The rails and ties are conveyed forward by power. The rails are carried on the rear cars. In running them forward, they are temporarily formed into two continuous lengths by means of angle bars. These extend from the front of the train to the rail supply, and are continually drawn forward by power compression rollers. At the front the rails are disconnected and put into the track. At the rear new rails are continually being added. Dead rollers are set up amidships on the intervening cars, and upon these the moving lengths are carried. The tie cars are situated ahead of those carrying the rail supply. The lowest ties are above the moving rail lengths, and by progressively removing the temporary support, the ties are dropped on the conveyor formed of the moving rails. When these arrive at the rear of the pioneer car, a special conveyor removes them from the rails and carries them overhead to a long cantilever projection extending ahead. From this they are finally dropped one by one on the subgrade. The rails are brought along beneath the cantilever. The whole train moves slowly but steadily forward, constantly discharging ties and rails.

In the Holman system rails are transported forward on one side of the train and ties on the other over lines of rollers. The rollers for the rails are grooved, while those carrying ties are cylindrical. The roller supports are in short lengths, flexibly connected, and set in brackets fitting into stake pockets of the ordinary flat car. At the front the final section of rollers is supported ahead by a cable or rod attached to a vertical frame. This support permits it to be shifted laterally, thus allowing delivery of the ties to be varied. The material is not conveyed by power, but the simplicity of the arrangement is advantageous; the chutes do not occupy loading space and are readily removed and replaced.

Contracts have been placed by the Oliver Estate, Pittsburgh, for equipment in the Oliver Building, with the Laidlaw-Dunn-Gordon Company, for a 750-gal. per minute crank and flywheel, high pressure pump and a 300-gal. compound duplex high pressure pump. Contracts are also pending for a refrigerating plant, boiler equipment, feed water heater, switchboard equipment, &c. William G. Boyle, Lewis Building, is consulting engineer.

The Iron Ores of the United States.*

Predictions of Time of Exhaustion Are Unwarranted.

BY C. WILLARD HAYES, WASHINGTON, D. C.

I should not have had the temerity to venture upon an inventory of the iron ore supplies of the United States except for the requirements of the Conservation Commission. During the preparation of this inventory I have been impressed by the wide diversity in estimates of those best qualified to hold an opinion, and I am, therefore, prepared in advance for criticism of my figures. Inasmuch as this report was prepared in large part for unprofessional readers, I considered it necessary to classify and describe the commercial iron ores in a somewhat elementary manner, in order to explain the reasons for the large element of uncertainty in the estimates. I have, therefore, given a chemical and a geological classification of iron ores, which place the commercial deposits in six classes: (1) magmatic segregations in basic igneous rocks; (2) contact deposits formed in connection with igneous intrusions; (3) concentration deposits; (4) replacement deposits; (5) bedded deposits, and (6) gossan deposits.

Ores Available and Not Available.

The iron ores are further distinguished under two classes: available and not available. This classification is in large measure arbitrary, and it is evident that it will vary from time to time. In the available class are placed those ores which can be worked at a profit under conditions essentially as they exist at present. Since it depends wholly on the question of costs, the various factors which affect cost will determine the classification of any particular deposit. Actual production, past and present, being determined by the interaction of various factors, affords the best criterion of availability. The two factors which enter most directly into the cost of ore at the furnace are accessibility and mining conditions. The principal factor affecting the cost of reduction and the value of the resulting product is the character of the ore itself. Another factor affecting availability is the nature of ownership, since a corporation which controls a variety of ores is equipped to assemble them and form any desired mixture or grade, and ores may under these conditions be used with advantage which would not be available if held by a smaller company. Because of the varying importance of these factors, future availability will obviously vary in a corresponding degree. An advantage which one district now possesses may pass to another. Thus, as the higher grade ores of the Lake Superior region become depleted, the lower grade ores will be called upon, with consequent increase in cost of transportation and smelting. The low grade ores of the Southern district, at present competing with the high grade Lake Superior ores, will then have a decided advantage because of the proximity to fuel supply.

The Various Groups of Iron Ores.

For convenience of description of the ores and discussion of the estimates, the known ore deposits are taken up by groups, based on distribution and kind. These groups are the following: 1. Lake Superior ores. 2. Adirondack ores. 3. Clinton ores. 4. Appalachian metamorphic ores. 5. Appalachian brown ores. 6. Appalachian carbonate ores. 7. West Tennessee brown ores. 8. East Texas brown ores. 9. Ozark ores. 10. Rocky Mountain metamorphic ores. 11. Igneous contact ores.

1. *Lake Superior Ores.*—The estimates of the Lake Superior ores are based upon the confidential records of practically all the mining companies of the region. This confidential information, however, is combined in such a way that no individual holdings are revealed. In this estimate the available ore under present conditions is taken to include all ore above 55 per cent. of iron and 25 per cent. of all ore between 45 and 55 per cent. of iron.

One of the most striking facts brought out by a recent compilation of a large number of diamond drill samples indicates that the average content of iron in the iron formation, excluding the beds now considered ore, exceeds 37 per cent. of metallic iron. This may be regarded as constituting a low grade ore not now available, but to be taken into account as a part of the total future reserves.

2. *Adirondack Ores.*—Estimates of the Adirondack ores are based upon information furnished by the New York State Survey. A certain portion of the titaniferous magnetites are included with the available ores. Although this may be objected to, it is based upon the assumption that either the percentage of titanium will be reduced by concentration methods, or the ores will be made available by modifications in furnace practice and the use of a special flux.

3. *Clinton Ores.*—From the nature of their occurrence the Clinton ores are more readily estimated than any other class of iron ores. The estimates of the New York Clinton ores are based upon information furnished by the New York Survey, and those in the Southern States chiefly upon information obtained by the United States Survey. Calcareous Clinton ores, carrying 30 per cent. of metallic iron, are classed as available, provided they are so situated as to be economically mined. None of the siliceous Clinton ores are considered at present available.

4. *Appalachian Metamorphic Ores.*—These ores include the deposits of magnetite and specular hematite, associated with crystalline and metamorphic rocks, of the Piedmont and Appalachian mountain belts, from southern New York to Alabama. Much uncertainty exists regarding the available tonnage in these deposits, and the estimates are correspondingly of low value.

5. *Appalachian Brown Ores.*—This division includes those deposits of limonite and other hydrous oxides which occur associated with the closely folded belt of sedimentary rocks from Pennsylvania southward to Alabama. Of these, the Oriskany ores are most readily estimated, while the ordinary concentration deposits of brown ores associated with other formations cannot be estimated with any degree of accuracy. The estimates of competent experts differ from the figures given in this paper by factors varying from 0.7 to 3.

6. *Appalachian Carbonate Ores.*—This division includes the thin beds of ores associated with the carboniferous rocks of western Pennsylvania, eastern Ohio and Kentucky, formerly an important source of iron, but now practically unworked. All of these ores are placed in the not-available class.

7. *West Tennessee Brown Ores;* 8. *East Texas Ores;* and 9. *Ozark Ores.*—From the nature of distribution and occurrence, estimates of the tonnage of ores in these districts in the lower Mississippi Valley are very uncertain.

10. *Rocky Mountain Metamorphic Ores.*—This group embraces deposits of magnetite and specular hematite associated with crystalline schists and gneisses at various localities in the Rocky Mountain region. Except the deposits in the Hartville district, Wyoming, very little is known concerning their distribution or tonnage.

11. *Igneous Contact Ores.*—This group is based exclusively upon geologic relations and includes widely separated deposits, the principal ones in the East being the Cornwall type of eastern Pennsylvania. Most of them are located in the Rocky Mountain and Pacific States. Some of these deposits are fairly well known, but concerning others only the roughest sort of an estimate is available.

Estimates of Domestic and Foreign Ores.

The estimates given in more or less detail under the above 11 groups are combined in Table I, under six commercial districts; namely, Northeastern, Southeastern, Lake Superior, Mississippi Valley, Rocky Mountain and Pacific Slope. As I have already stated, it is not expected that the figures given in this table will in every case meet with acceptance, and they are offered as representing merely the best consensus of opinion at which I have been able to arrive.

I have considered very briefly the supplies of foreign iron ores so situated that they will probably enter into the iron industry of the United States in the future (see

* Abstract of report prepared for the Conservation Commission, presented as a paper at the New Haven meeting of the American Institute of Mining Engineers, February, 1909. Mr. Hayes is chief geologist, United States Geological Survey.

Table I.—Estimates of Iron Ore Supplies of the United States.

Commercial Districts. States	Magnetite ores. Non-Titaniferous. A.	Magnetite ores. Non-Titaniferous. B.	Magnetite ores. Titaniferous. A.	Magnetite ores. Titaniferous. B.	Hematite ores. Specular and Red. A.	Hematite ores. Specular and Red. B.	Hematite ores. Clinton. A.	Hematite ores. Clinton. B.	Brown ores. A.	Brown ores. B.	Carbonate ores. A.	Carbonate ores. B.	Total supplies. A. Available.	Total supplies. B. Not available.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.	Gross tons.	Gross tons.	Gross tons.	Gross tons.	Gross tons.	Gross tons.	Gr. tons.	Gross tons.	Gross tons.	Gross tons.
1. Northeastern	160,000,000	111,500,000	90,000,000	100,000,000	2,000,000	2,000,000	35,000,000	620,000,000	11,000,000	13,500,000	....	248,000,000	298,000,000	1,095,000,000
2. Southeastern	*12,500,000	23,000,000	.....	.....	8,000,000	53,000,000	463,540,000	970,500,000	54,400,000	168,000,000	....	62,000,000	538,440,000	1,276,500,000
3. Lake Superior	.....	.....	25,000,000	.....	3,500,000,000	67,475,000,000	10,000,000	30,000,000	300,000,000	560,000,000	....	.....	3,510,000,000	72,030,000,000
4. Mississippi Valley	4,500,000,000	.....	.....	.....	15,000,000	10,300,000	.....	.....	2,000,000	1,625,000	....	.....	315,000,000	570,000,000
5. Rocky Mountain	*51,485,000	†115,440,000	.....	1,500,000	4,275,000	2,100,000	.....	.....	.....	105,000	....	.....	57,760,000	120,665,000
6. Pacific Slope	*68,950,000	11,800,000	.....	2,000,000	.....	10,000,000	.....	.....	.....	.....	....	.....	68,950,000	23,905,000
Totals	292,935,000	4,761,740,000	90,000,000	128,500,000	3,529,275,000	67,552,100,000	508,540,000	1,620,500,000	367,400,000	743,230,000	....	310,000,000	4,788,150,000	75,116,070,000

1. Vermont, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Maryland, Ohio. 2. Virginia, West Virginia, Eastern Kentucky, North Carolina, South Carolina, Georgia, Alabama, East Tennessee. 3. Michigan, Minnesota, Wisconsin. 4. Northwest Alabama, West Tennessee, West Kentucky, Iowa, Missouri, Arkansas, East Texas. 5. Montana, Idaho, Wyoming, Colorado, Utah, Nevada, New Mexico, West Texas, Arizona. 6. Washington, Oregon, California.

* Includes some hematite. † Includes some titaniferous magnetite.

Table II.). These are the Canadian and Newfoundland ores and Cuban ores. None of these countries has an abundant fuel supply, and, therefore, either the fuel must be imported or the ore exported. The history of the iron industry indicates that the latter is more likely to occur, particularly since the industry is already established, and the chief market for the finished product is near the fuel supply. This tendency may be interrupted by artificial means, such as a bonus or a tariff, but such interference with the natural course of industrial development is only temporary, and in the long run the industry will gravitate to the point of lowest cost of production.

Table II.—Estimated Available Foreign Iron Ore. *Gross Tons.*

Canada:	
British Columbia, magnetite chiefly	30,000,000
Lake Superior District, hematite chiefly	9,000,000
Nova Scotia, Clinton hematite	4,000,000
Newfoundland, Clinton hematite	30,000,000
Mexico, magnetite and brown ore	.....
Cuba:	
Santiago District, hematite	5,000,000
Mayari, Moa, Baracoa, Cubitas and Pinar del Rio Districts (limonite)	1,500,000,000
Total	1,578,000,000

Imports and exports of iron ore:	Gross tons.
Total imports, 1889-1907	14,705,842
Total exports, 1899-1907	1,271,214

The production of iron ores by commercial districts in 1906 and 1907 is given in Table III.

Table III.—Production of Iron Ores in the United States by Commercial Districts in 1906 *and* 1907.

District.	1906. Gross tons.	1906. Percentage of total.	1907. Gross tons.	1907. Percentage of total.
1. Northeastern	2,582,666	5.40	2,822,822	5.45
2. Southeastern	6,208,140	13.00	6,197,360	12.00
3. Lake Superior	38,035,084	79.66	41,638,744	80.50
4. Mississippi Valley	117,570	0.25	230,435	0.46
5. Rocky Mountain	806,268	1.70	831,258	1.60
6. Pacific Slope	*	....	*	....
Totals	47,749,728	100.00	51,720,619	100.00

* The small production of California and Washington is included in the production of the Rocky Mountain District.

The data in Table III indicate the commanding position of the Lake Superior district in the iron industry, with 79.66 and 80.50 per cent. of the total production for the years 1906 and 1907.

The production of iron ore in the United States by decades, from 1870 to 1909, is given in Table IV.

Table IV.—Production of Iron Ore in the United States by Decades, 1870 *to* 1909.

Decade.	Production. Gross tons.	Increase. Per cent.
1870-1879	43,770,527	...
1880-1889	91,043,854	108
1890-1899	163,989,193	80.1
1900-1909,	about 392,000,000	138

Conclusion.

Each of the decades given in Table IV, if shown by a production curve, would contain a depression in which there was an actual decrease in production, so that they may be taken as fairly representing the tendency of the industry. These rates of increase are such that they do not permit the construction of a curve on which predictions for the future can be based. A comparison of the first and second rates, 108 and 80.1, would indicate a rapid decrease in the rate of increase, which if continued would have placed the date of maximum production about 1930. But a comparison of the second and third rates, 80.1 and 138, would indicate a rapid increase in the rate of increase. If the average rate of increase by decades, 108.7 per cent., should be continued, it would require the production in the next three decades of 6,088,000,000 tons. But the ore supply now available in the United States is estimated at 4,786,000,000 tons, which is only 78 per cent. of the amount needed on this assumption. It is evident, therefore, that the present average rate of increase in production of high grade ores cannot continue even for the next 30 years, and that before 1940 the production must already have reached a maximum and begun to decline, and a very large use must be made of low grade ores not now classed as available. The second condition, with its consequent greatly increased cost of iron, is the only thing which can prevent a decline in the iron industry, measured by the amount of pig iron produced, within the next 30 years, unless there is in the

meantime very greatly increased importation of foreign ores.

In view of the many factors entering into the problem, the tendency of which is not always determinable, to say nothing of the weight that should be given them, any further prediction as to the date of exhaustion of the iron ore supplies is so uncertain as to be wholly unprofitable and unwarranted.

Wage Systems.*

BY ROBT. GOLDMANN, SCHENECTADY, N. Y.

Every wage system aims to create fair relations between workman and producer. The workman must be assured that for higher efficiency he will receive better pay. He on his part will then strive to attain this high efficiency, and as this is in the especial interest of the manufacturer we arrive at the point where the two extremes meet. The employer should realize that in paying higher wages the total costs up to a certain limit do not increase but decrease. The better paid man works faster and better, spoils less material, runs his machine and tools more economically, is more ambitious—and what is most important has greater confidence in his employer. In spite of higher hourly payment, the piece price will often be less because the output is increased. Other advantages are saving in overhead expenses in proportion to the time saved, using invested capital to better advantage and ability to complete orders more rapidly, which is the great point in obtaining and retaining customers. Generally the average hourly expenses are greater than the average hourly wage costs, so that saving time means more than simply saving wages. A one-fifth saving of operating time means a 1 per cent. return on invested capital obtained at 5 per cent. While an enlarged output increases running expenses, necessitating more clerks, superintendents and laborers, and more wear and tear on machinery, these costs remain constant in proportion to the production, or in most cases diminish.

Day Pay.

The oldest wage system, the day pay, does not encourage the man to complete the job in the shortest time possible. This is apparent in the diagram, where abscissæ represent time in tenths of an hour and ordinates the hourly earnings by divisions of 5 cents. If an operation takes one hour and a man's pay is 25 cents per hour this is shown at *a*, the intersection of the co-ordinates through 1 and 25. If the job takes only half an hour, the hourly rate is the same as before, as shown by point *b*. The day pay is thus represented by the horizontal line through 25, or the number corresponding to the man's rate. The man gets his wages for every working hour, whether the work is done fast or slow, therefore if generally used it would be the ideal system of the future socialist state.

Sometimes the day rate is necessary as when the operating time cannot be calculated nor determined by experience and when exceptional precision is called for. In these cases its disadvantages should be avoided by the use of reliable men.

Taylor & Gantt Systems.

Two of the best systems are F. W. Taylor's differential piece system and H. L. Gantt's premium system, but the author can recommend them only in connection with the complete Taylor system of shop management. By means of the latter those who come up to the standard can be accurately distinguished from those who do not. To award Gantt's fixed premium to the standard time workman is unfair to the man who falls below by a few minutes, since he receives no premium whatever. This sudden fall from the hourly rate where premium is made to where premium is forfeited is distinctly illustrated by the diagram and by the table. The great advantages of the combined Taylor and Taylor, or Gantt and Taylor systems are lost entirely in a combination of them with any other general system.

Efficiency System.

Under Harrington Emerson's efficiency system, as in all other premium systems, a standard time is assumed. The fundamental difference is that the workman who comes up to the standard time receives a premium of 20 per cent.; if he requires less time the premium will increase, or more time decrease. The ratio between time allowed and time taken, expressed in percentage, is called the "efficiency." Different percentages of bonus correspond to different rates of efficiency. If a 30-cent man does a job in exactly the time allowed his efficiency is rated at 100 per cent., and he receives a premium of 20 per cent. It seems illogical to award a bonus for doing the work in the allowed time, but in practice this is adjusted by allowing a 30-cent man only 25 cents an hour, so that his hourly rate plus the 20 per cent. premium will be equivalent to the nominal rate of 30 cents per hour.

A practical objection to the system is that it requires too much calculation and, therefore, heavy office expense. Mr. Emerson's own example may prove this. If a man's wages are 30 cents per hour, if in the month he has been present 240 hr. and has delivered 210 hr., his efficiency

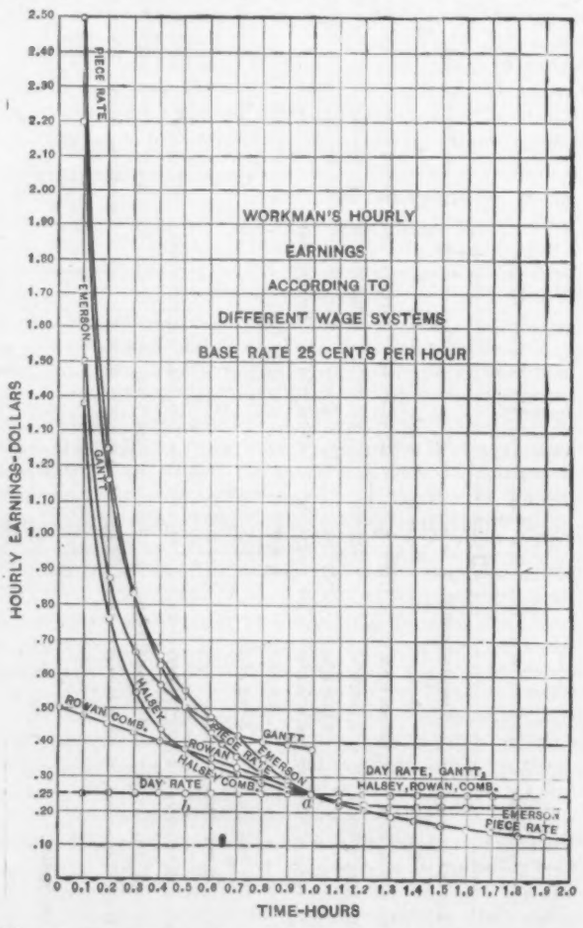


Diagram Showing the Characteristics of Various Wage Systems.

is 87½ per cent. By the premium table the corresponding bonus is 0.0794 per one dollar of regular wage. This regular wage, the product of time taken and the man's rate, is $72, which, multiplied by the bonus 0.0794, gives the premium as $5.72, to be added to the $72. Most manufacturers, by the way, close up their payrolls, not by the month, but by the week or by two weeks. The accounting department has to calculate the individual job price, and must go through all this figuring for each individual case. The calculation will become even more complicated if the workman shows an efficiency of more than 100 per cent., as there will then be wages to add for the additional work done in the time saved. In plants where small jobs are frequent, figuring the piece price puts the system almost out of question. An additional disadvantage of this complicated calculation is that the workman will hardly be able to verify his payroll, resulting in dissatisfaction and mistrust.

The Emerson system allows a premium which is more than 50 per cent. of the time saved; this is too much, as will be shown later. If, on the other hand, there is more

* From a paper presented before the National Metal Trades Association, April 15, 1909.

time taken than allowed, the hourly rate falls down to 80 per cent. of the regular rate, and this, as also will be proved, is not to be advocated.

Piece Work Plan.

Casually examined, the piece rate system seems to be extremely economical and fair, twice as much being paid for two pieces as for one. The trouble is inability to determine the price of one piece. Except those factories using the Taylor system, and the very efficient time slide rule invented by Karl G. Barth, many have at best a very poor time study and, therefore, a poor knowledge of the time required. What is termed "time study" is generally nothing but guesswork. All who neglect the use of slide rules and other valuable devices are unable to find the exact operating time. Therefore, the gain and loss against the time allowed is not necessarily the fault of the employee; in many cases it might be credited to the employer.

The piece rate is the product of the average working time and average rate. A job which is estimated to take 10 hr. with an average rate of 25 cents per hour is then allowed $2.50. As an extreme case suppose a man takes but 5 hr., evidently there was a mistake in the time estimate. Very rarely a man is able to work twice as fast as the average, so that if even 50 per cent. of the time is saved a part of it must be due to a mistake in time estimate. If 10 hr. were allowed for an operation than was estimated the employer will cut the rate. The workman will feel this to be a grievous injustice and seek to prevent it in the future by purposely working slower than his ability would warrant. This system, therefore, not only gives a far too high premium, but has the disadvantage of the day pay system in keeping back the progress of work.

In factories such as make sewing and shoe machinery, where the same operations are continuously repeated, it is possible to compute the standard operating time to the fraction of a minute, and the piece rate system is as justifiable as any other.

Miscellaneous Systems.

Against the different wage systems the objection is raised that for a definite job to allow the same time to the high priced and to the low priced workmen is not consistent. To offset this two premium systems have been recommended, but they are too complicated to be practical. A wage system must not be too complicated, and cannot be expected to solve all problems in the management of a concern. The author believes that under proper management the above objections would be without foundation.

The Halsey System.

Under the Halsey premium system the workman has the assurance that he will receive better payment for higher working efficiency and thus will try to accelerate

HOURLY RATE ACCORDING TO DIFFERENT WAGE SYSTEMS

MAN'S RATE: 25c

STANDARD TIME: ONE HOUR.

TIME TAKEN	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
DAY-RATE	.25	.25	.25	.25	.25	.25	.25	.25	.25	.25	.25	.25	.25	.25	.25	.25	.25	.25	.25	.25
GANTT 50%	1.50	.87$_5$	.66$_7$	.56$_3$	.50	.45$_5$	.42$_5$	.40$_6$	.39$_3$	.37$_5$	.25	.25	.25	.25	25	.25	.25	.25	.25	.25
EMERSON	.52	.49$_9$	.53$_0$	.45$_6$	.44$_7$	.41$_6$	.39$_5$	.33$_4$	.29$_2$	.25	.23	.21$_8$	.21$_2$	.20$_9$	.20$_8$	20$_8$	.20$_8$	.20$_8$	.20$_8$	.20$_8$
PIECE-RATE	2.50	1.25	.83$_3$	.62$_5$	.50$_0$	.41$_7$	.35$_7$	.31$_2$	.27$_8$	.25	.22$_7$	.20$_8$	.19$_2$	.17$_9$	.16$_7$	.15$_6$	.14$_7$	.13$_8$	.13$_1$	.12$_5$
HALSEY 50%	1.37$_5$	.75	.54$_2$	.43$_8$	.37$_5$	.33$_3$	.30$_4$	.28$_1$	.26$_4$	.25	.25	.25	.25	.25	.25	.25	.25	.25	.25	.25
ROWAN	.47$_3$	.45	.42$_8$	.40	.37$_5$	.35$_3$	.32$_5$	.30	.27$_5$	.25	.25	.25	.25	.25	.25	.25	.25	.25	.25	25
COMB. H.-R.	.47$_7$	.45	.42$_8$	.40	.37$_5$	.33$_9$	.30$_4$	.28$_1$	.26$_4$	.25	.25	.25	.25	.25	.25	.25	.25	.25	.25	.25

Table Comparing Various Wage Systems.

completed in 5 hr. the same price must be paid—10 × 25, instead of 5 × 25—and the man receives $1.25 more than he is entitled to. By using F. A. Halsey's 50 per cent. premium system the workman receives besides his regular rate a premium which equals 50 per cent. of the time saved. In this case he receives (5 × 25) + (5 × 12½) = $1.87½; he therefore gets with the Halsey system only 26½ cents in excess of his just compensation. As to the other extreme, if a man is allowed 5 hr. and his operating time is 10 hr. he then gets by piece work 5 × 25, or $1.25. With Halsey's system he gets 10 × 25, or $2.50. At piece rate this man receives 12½ cents an hour, while by the premium system he receives 25 cents, the rate at which he was employed. With the Halsey system the man is not allowed as unreasonable a reward for the time saved as by the piece system, and on the other hand, he is guaranteed his hourly rate if time is lost. If the mistake is the employer's in fixing the time it is unjust to make the man suffer.

Wage rate and wage system should not be confused. With the wage rate the man's ability is paid for—the wage system should induce him to work faster and more satisfactorily within the range of his ability. To automatically meet both these requirements at the same time with the piece system cannot be expected. The claim that with the piece rate system costs remain constant, enabling fixing in advance the cost of our production, is not true, for the man who works faster not only saves his own time but machine time, diminishing the overhead expense, and conversely. The diagram also shows that the hourly rate increases unreasonably with the amount of time saved, and that it decreases as unreasonably with the time lost.

As soon as the operation is completed in far less time his work to gain a high premium. The employer, besides getting fast work, saves 50 per cent. of the wage rate for the time gained. If the employee with the time allowed for an individual job has no chance of earning a premium he will, nevertheless, endeavor to finish it quickly to avail himself of the time saved for the next premium job. Every well organized factory will keep records of the time taken by the individual workman for different operations, noting particularly the time gained or lost from that allowed. As the workman is aware that he is under strict control—and this system promotes such strict control—he has an additional reason for accelerating his work.

Should the employer feel compelled to reduce the time allowed—and he is less likely to with this system than with the piece system—the employee feels it less, as he will receive at least the rate promised. To further raise employees' ambition a certain period should be guaranteed during which the allowance of time will not be reduced. Any temptation to deceive the employer as to the amount of time required—the source of much disagreement—is then practically eliminated.

Between the two premiums, 30 per cent. or 50 per cent., Mr. Halsey is in favor of the lower rate, but the author does not agree with him. With the Halsey system, in addition to the 50 or 70 per cent. saved in wage pay, the so-called machine cost is lowered and time gained. The latter involves many other items compared with which the difference between the 30 and the 50 per cent. premium is almost insignificant. On the other hand, a 50 per cent. premium will be a much stronger stimulant to the employee.

Up to a 50 per cent. time saving the Halsey premium is a due compensation for the man's endeavor, but should

he save more time the wage rate will be too high, as the diagram and the table indicate. The employee who saves six-tenths of the time will receive instead of his regular hourly rate of 25 cents, 43.75 cents; if he saves seven-tenths of the time, 54 cents; saving eight-tenths he gets 75 cents, and if he requires only one-tenth of the time allowed $1.375 per hour. These great deviations prove that the Halsey system will not be found practicable in the exceptional cases mentioned above.

The Rowan System.

By Rowan's system the workman who saves one-tenth of the time receives 1.1 times his regular rate; saving x tenths he gets $1 + \frac{x}{10}$ times the regular hourly pay. If he takes more than the time allowed he will receive according to the Rowan system, as well as all other premium systems except Emerson's, the full hourly rate. The employee requiring less than, but more than half of the time allowed, for instance, 0.9, 0.8, 0.7 or 0.6 of the time, receives a greater premium with the Rowan than with the Halsey system, as shown by the diagram and the table. Liberal premiums should be paid, but since employees are not fined for failing to gain time, they should not expect a premium of more than 50 per cent. It is ample inducement, gives complete satisfaction to the employer and will likewise meet the just expectation of the employee.

A New Combination.

Reviewing the systems so far discussed shows that where the workman requires too much time the Halsey and Rowan systems are equally satisfactory; where he requires more than half the time allowed but less than the whole allowance, the Halsey system is the best; where he takes less than half the time allowed the Rowan system is preferable to all other systems. If the workman uses exactly half the time allowed he receives the same premium according to both Rowan and Halsey. (The diagram shows this to be the intersection of the two curves.) This is the point where both systems change their practicability. By combining both systems, applying Halsey's where the gain of time is below 50 per cent. and Rowan's where it is in excess, the author is convinced that the most satisfactory wage system is established.

The Niagara Ice Jam.

NIAGARA FALLS, N. Y., April 24, 1909.—Several tons of dynamite were employed to shatter the great Niagara ice jam which this week so seriously endangered the power houses and bridges of the Niagara gorge. For several days it was observed that the water advanced higher each day, so that by Wednesday the alarm had increased very materially. As the river above the falls was not flowing at an abnormal hight, it was apparent to close watchers that the stream was not discharging into Lake Ontario at a normal rate. This developed the conviction that the gorge and that portion of the river between the mouth of the stream and Lewiston had become one vast reservoir, and that it was gradually filling up.

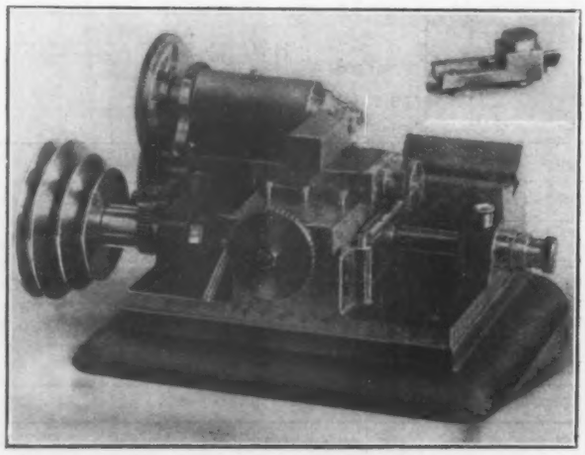
Under these circumstances the United States War Department had its attention drawn to the matter, but its engineers had no plan of relief to offer. Governor Hughes took the matter up at the request of the president of the village of Lewiston, and in this manner the State Department of Public Works got busy. Assistant Superintendent Kunze went to Fort Niagara, and after an inspection of all features of the jam resolved that dynamite was the remedy to apply. A supply of this explosive was hurried to the mouth of the river, and last Thursday the first blasts were exploded. As the day wore away the results were not encouraging, but the next morning it was found that the river had gone down. The dynamite had opened a channel to the lake under the ice, which had been grounded on sand bars there located. Further dynamiting took place Friday and to-day, the result being that the river was restored to practically its normal level. After this the ice began to break up and settle. The danger to the lower suspension bridge, buildings, &c., in Lewiston had passed.

On Friday the ice fell away from the locality about the station of the Ontario Power Company near the falls, but the machines in this station are not yet in operation. A large force is at work devoting every effort to restoring normal conditions, but it is not yet apparent when the electric current will again flow from the giant generators. Two steel transmission towers of this company have been knocked over by the ice between Niagara Falls and Lewiston, the towers having been located near the water's edge on the Canadian side.

The Niagara Gorge Railroad is employing as much labor as possible in the effort to restore its line to the point where it will again be possible to operate it. This work is likely to take weeks. The ice jam is looked upon as the greatest disaster that ever struck the Niagara gorge and its interests. D.

The Waltham Cutter Turning and Backing-Off Machine.

Primarily for making formed cutters used in watch and clock machines, the Waltham Machine Works, Waltham, Mass., has designed the cutter turning and backing-off machine illustrated. It has sufficient power, however, to handle cutters up to 2½ in. in diameter and of 24 diametrical pitch or of coarser pitch of small diameters. The backing-off or relieving of the cutter is obtained through a cam mounted on the driving shaft and connected to the



A Machine for Turning and Backing Off the Teeth of Small Gear Cutters, Made by the Waltham Machine Works, Waltham, Mass.

lower cross slide through a reducing lever. The driving shaft is connected with the work spindle through a train of gears, and with the change gears regularly furnished any number of teeth between 4 and 16 may be backed off, or with extra gears cutters up to and including 20 teeth may be handled.

A hand wheel graduated to 0.0005 in. on the feed screw of the upper cross slide gauges the depth of the cut, while the side adjustment of the tool is obtained through the longitudinal slide adjusted by a screw with hand wheel graduated to 0.001 in. The forming tool may be either rectangular or circular, as desired; if rectangular it may be of any size up to ⅜ in. square; if circular from 1 to 1¼ in. diameter.

The machine may be used for forming master cutters as well as for backing-off teeth. The cam is made inoperative by turning the lever at the left of the cross slides, and when the lower slide is clamped by the lever on the right the two remaining slides may be used in the same manner as a compound rest on a lathe. The headstock carrying the work spindle may be used either on the right or the left side of the tool. As the profile of the bed to which the headstock is clamped is an arc having its center coincident with that of the work spindle the reversing of the position of the headstock has no effect upon the distance of the work from the tool. One side of a cutter may be formed with the headstock on the left, and without removing the work from the arbor or the tool from the holder, by reversing and moving the headstock to the right, the opposite side may be given the same form and diameter. The work spindle, cam shaft and bearings are of hardened steel. The base is 11 x 14 in. and the machine weighs 100 lb.

The Newark Gear Cutter Grinder.

A machine solely intended for grinding gear cutters, designed to combine simplicity and accuracy in operation, is shown in Fig. 1. The machine is always set up for grinding gear cutters, and this is argued by the maker, the Newark Gear Cutting Machine Company, Newark, N. J., to be a distinct advantage over the use of attachments on universal tool grinding machines. In many cases cutters can be ground on this machine before an attachment can be set up on a universal machine. By reason of its simplicity the cost of the machine is comparatively low, so that it is reasonable for shops using only one gear cutting machine to install one of these grinders.

The cutter to be ground is mounted on the fixed stud *a*, Fig. 2, which is ⅞ in. in diameter. When cutters with

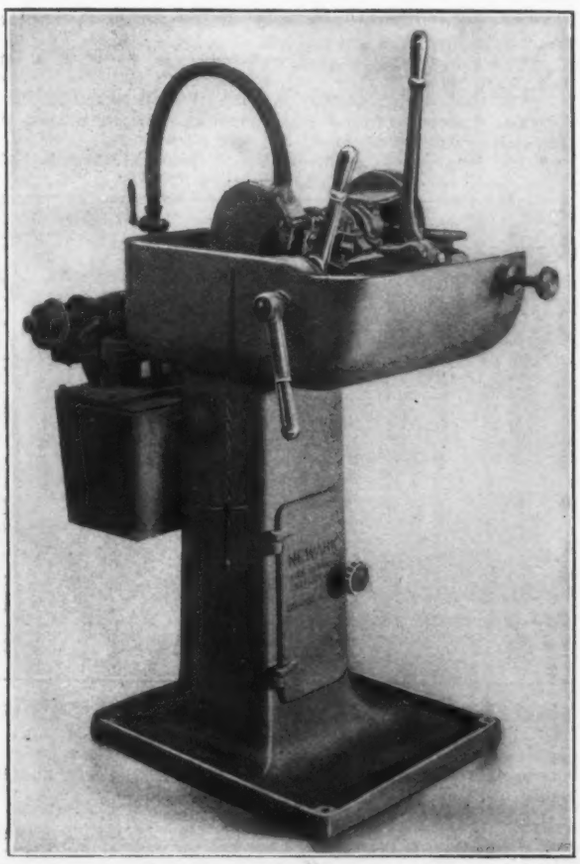


Fig. 1.—A Gear Cutter Grinder Built by the Newark Gear Cutting Machine Company, Newark, N. J.

larger holes are ground bushes are used, a complete set of which is part of the regular equipment. The table in which this stud is fixed is adjustable parallel to the axis of the grinding wheel spindle, to set the edge of the wheel in line with the center of the cutter stud. The stand *b* upon which the table is mounted is adjustable upon a trunion, *c*, thus providing means to tilt the table up or down. This adjustment allows heavy pitch gear cutters to be ground in the two corners between the teeth, without changing the wheel or removing the cutter from the stud, and also affords instant adjustment to place the cutter central with the wheel to suit different thicknesses of cutters. On most work the tilting table is used horizontally or nearly so. The machine will take cutters from 1¾ up to 8 in. in diameter.

A pawl on the table is adjusted to touch the back of the tooth to be ground, and after once being set the cutter can be rotated from tooth to tooth. After the cut has been taken once around, the pawl is adjusted by a screw to slightly rotate the cutter, so that another cut may be taken. This adjustment, which is the feed, is thus always radial after the cutter is once set. No dials are used for the indexing, as the pawl operates on the backs of the teeth of the cutter itself. The original accuracy of the cutter is, therefore, maintained throughout its life. By reason of the simple indexing means, it is not necessary to count the number of teeth on the cutter nor to select the proper dial for that number. On this machine the operator can commence grinding while the operator on other machines is counting the teeth, selecting the dial and adjusting the indexing mechanism properly. There being fewer parts on the machine, it is less likely to wear out of alignment, and this is important in a grinding machine.

The grinding wheel is 8 in. in diameter, with a 1-in. hole, and is of dished form. It is mounted upon a hardened and ground spindle which runs in phosphor bronze bearings adjustable for wear. The end of the spindle outside of the water basin is used as a hand tool grinder, upon which wheels worn too small for the gear cutter grinding can be used. The grinding wheel spindle is mounted upon a carriage which is operated by a vertical lever. This gives the grinding stroke. An adjustable stop regulates the depth to be ground. The water used to keep the cutter cool while being ground is supplied from a centrifugal pump supported at the rear of the column. The water does not remain in the large basin, but flows down to a reservoir at the side of the pump and is used repeatedly after the grinding dust is separated from it by means of baffle plates. The column is of box form and forms a cabinet for cutters, grinding wheels, &c.

Many conveniences are embodied in this machine, such as the use of fixed handles where possible, to avoid the

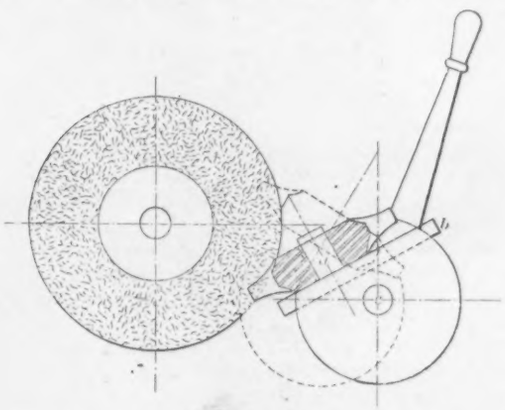


Fig. 2.—Showing the Manner of Grinding the Corners Between Gear Cutter Teeth.

use of wrenches. This affords the opportunity for quick operation of the machine. Where wrenches are required they are secured to the column by means of a chain, to prevent them from being lost or taken away for use on other machines. The regular equipment includes two grinding wheels, a diamond truing device, bushes to take cutters, in connection with the ⅞-in. stud, with 1, 1 1-16, 1¼, 1½, 1¾ and 2 in. holes, and an overhead countershaft.

The gas blowing engines recently installed at the blast furnace plant of the Frodingham Iron & Steel Company, Frodingham, England, are the first of the Klein type in Great Britain. The Klein engine is a double acting two-cycle gas engine of the Koerting type, and 68 have been installed. Among the large units are those at Bochum, Westphalia, where a 1400-hp. gas blowing engine has worked continuously for 14 months, and five 1600-hp. blowing engines at the Krupp Works. The plant at Frodingham consists of four single cylinder double acting engines of 1050 hp. each. Tests show an efficiency ranging from 75 to 77 per cent., and one of the engines has run continuously for six weeks. The capacity of the plant is about 21,000 cu. ft. of air per minute compressed to 13 lb. pressure.

The Robertson Drill & Tool Company, 1848 Niagara street, Buffalo, N. Y., having found that its line of Royal power saws is suffering from the substitution of other machines which are sold to unsuspecting persons who have the impression that they are getting these saws, has now determined to cast its trademark in these machines. This is, of course, intended as a protection to buyers to guard them against substitutes being imposed upon them.

The Taylor & Fenn Power Feed Drill.

A new principle of automatic power feed is embodied in the type C manufacturers' drill press, Fig. 1, built by the Taylor & Fenn Company, Hartford, Conn. Apart from the feed the machine is of the same design and construction as the company's type A drill press. As the top column is interchangeable with those of the other drills built by the company the new type may be mounted with them in any combination on the same base. The new machine may be advantageously employed in drilling holes from 3-16 to ¾ in. diameter of 3 in. maximum depth. It has two rates of feed, 0.0071 in. and 0.0096 in. per revolution of the spindle.

In the standard type C machine each spindle has an independent automatic power feed, with quick return, but the mechanism can be applied so as to feed all spindles simultaneously, or the power feed may be

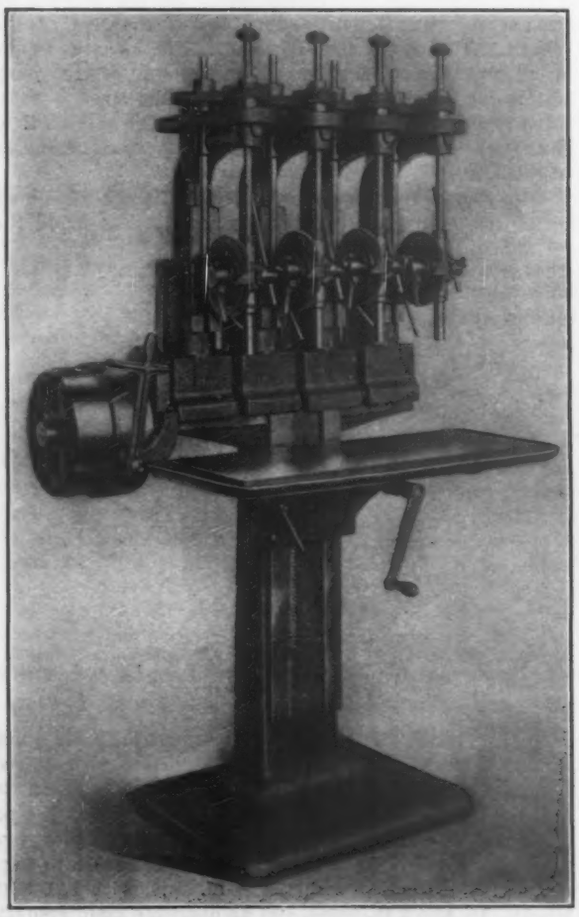


Fig. 1.—The Type C Manufacturers' Drill Press Built by the Taylor & Fenn Company, Hartford, Conn.

disengaged and the lever feed used as in the type A drill. A train of spur gears from the spindle transmits power to a secondary vertical shaft upon which is a worm, meshing the large worm gear, details of which are shown in Fig. 2. By this arrangement the feed can operate only when the spindle is in motion. The worm gear has a bronze rim and hardened steel center in the face of which notches are cut to form a clutch ring for receiving the driving lever. The worm wheel runs free on a large bronze bushing when the driving lever is disengaged, and always remains in mesh with the worm, so that the wear is distributed evenly over all the teeth. The driving gear is fastened to a clamp collar fitting on the end of the feed pinion shaft, which is octagon in shape, permitting of eight settings of the lever. If shortening or lengthening the length of feed is desired, to conform with the work, it is accomplished quickly by loosening the binder screw on the clamp collar, slipping it off and replacing it in the position that will give the lever the minimum of travel to the knock-off. The lever is held in position in the clutch ring by friction, and is disengaged by a hardened steel knock-off, which has an adjustment greater than the distance between the notches on the clutch ring, and may be set to drill holes of a given depth with great accuracy.

The feeds may be changed one to the other by loosening the nut on the intermediate gear stud, which carries a large gear with a small gear on its hub. Inverting the gears, engaging the smaller with the gear on the feed shaft and the larger with that on the gear spindle, gives the slower feed. All gears are protected by guards.

The Annual Meeting of the Iron and Steel Institute.

For the annual meeting of the Iron and Steel Institute, to be held at the Institution of Civil Engineers, London, May 13 and 14, the following papers have been announced:

"The Production of Iron Sheet and Tubes in One Operation," by S. Cowper-Coles.

"The Preservation of Iron and Steel," by Dr. A. S. Cushman, Washington, D. C.

"The Manufacture of Peat Fuel," by Dr. M. Ekenberg.

"The Chemical Physics Involved in the Decarburization of Iron Carbon Alloys," by W. H. Hatfield.

"The Relation of the Solubility of Iron and Steel in Sulphuric Acid to Its Heat Treatment," by Prof. E. Heyn and O. Bauer.

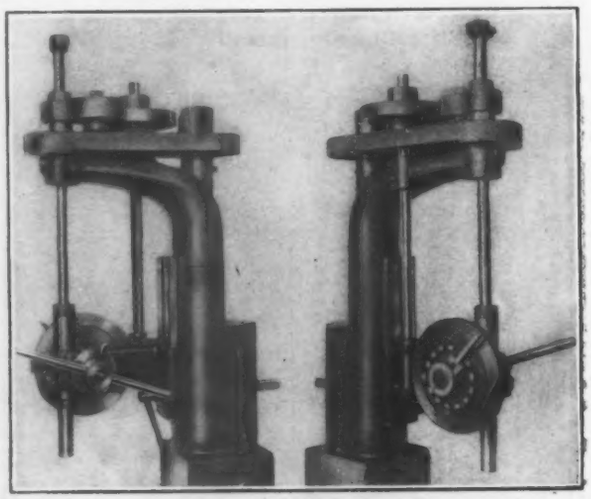


Fig. 2.—Views of the Two Sides of One of the Heads of the Taylor & Fenn Type C Drill.

"High Tension Steels," by P. Longmuir.

"The Bristol Recording Pyrometer," by P. Longmuir and T. Swinden.

"A Heat Treatment Study of Bessemer Steels," by Prof. A. McWilliam and E. J. Barnes.

"The Roechling-Rodenhauser Electric Furnace," by W. Rodenhauser.

"The Value of Physical Tests in the Selection and Testing of Protective Coatings for Iron and Steel," by J. Cruickshank Smith.

"Further Experiments on the Ageing of Mild Steel," by C. E. Stromeyer.

"A Comparison of the Methods of Determining the Hardness of Iron and Steel," by Prof. T. Turner.

"The Rusting of Iron, and Modern Methods for Its Prevention," by Prof. W. H. Walker, Boston, Mass.

A supplement to the report on the determination of carbon and phosphorus in steel, presented by the special committee appointed in 1901, will be submitted by A. A. Blair, Philadelphia, Pa.

The Bessemer gold medal for 1909 will be presented to A. Pourcel of Paris. The awards of the Andrew Carnegie medals and research scholarships for 1909 will be announced.

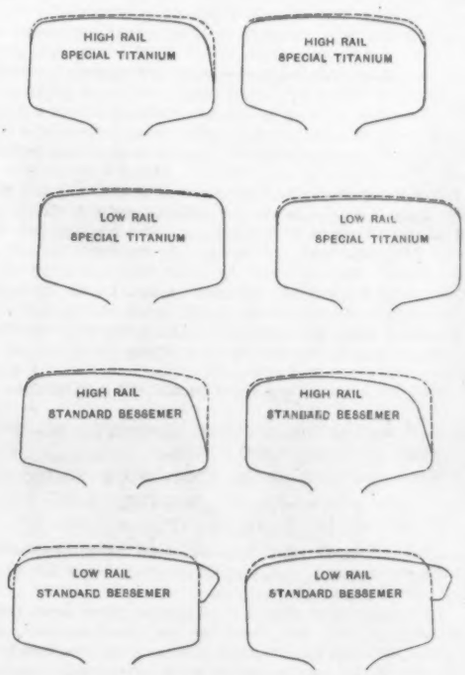
Owing to the unavoidable pressure of his engagements Sir W. Thomas Lewis, the president-elect, may not be able to be present, and in that contingency Sir Hugh Bell, the retiring president, has consented to occupy the chair at the meeting.

The autumn meeting will be held in London, September 28, 29 and 30. Morning sessions for the reading and discussion of papers will be held at the Institution of Civil Engineers, Great George street, Westminster.

Titanium Alloy Rails on the Baltimore & Ohio Railroad.

In a paper on "Titanium Alloy in Rails and Car Wheels," read at the meeting of the Railway Club of Pittsburgh, April 23, Charles V. Slocum, special agent of the Titanium Alloy Mfg. Company, Pittsburgh, quoted at some length from the article on "Ferrotitanium Steel Rails" in *The Iron Age* of March 25, page 988, and gave hitherto unpublished facts concerning the wear of rails in the manufacture of which titanium alloy was used. These rails were laid on Kessler's Curve, Baltimore & Ohio Railroad. The portions of the paper referring to them and to the use of titanium alloy in the manufacture of chilled car wheels are as follows:

The first trials of the alloy on a large scale were made at the works of the Maryland Steel Company in November and December, 1907. Rails made by them are still undergoing one of the most comprehensive trials to which it was possible to subject such material, viz., the test of actual service. The attention of the railroads of the country was directly called to the test started on



Comparative Wear in 17 Weeks on Kessler's Curve, Cumberland Division, Baltimore & Ohio Railroad—Wear, titanium rails, 1.45 lb. per yard; standard Bessemer, 4.18 lb. per yard. Heavy traffic, 9 deg. curve, 6½ in. elevation.

October 7, 1908 (and still in progress), on Kessler's Curve, Cumberland Division, Baltimore & Ohio Railroad, so that all who cared to do so might watch this trial. Kessler's Curve is a 9-degree curve, 6½-in. elevation, 90-lb. rails, 0.55 carbon in the plain Bessemer rails and 0.48 carbon in the treated or titanium rails. The actual wear of these rails to date of last diagram, February 12, 1909, was 4.18 lb. per yard for the plain Bessemer and 1.45 lb. per yard for the treated or titanium rails, or nearly 300 per cent. in favor of the treated rails up to the date named. As illustrated in the diagram, the treated rails show what might be termed healthy wear, with every indication that the steel is perfectly solid and homogeneous, while the untreated rails have "flowed" seriously, showing excessive wear and the usual indications of segregation, &c. The indications are also that the Bessemer rails will soon have to be removed, while the titanium rails are apparently good for at least several months.

Titanium Alloy for Car Wheels and Ingot Molds.

An improvement in the chilled iron car wheel is a subject of great interest to railroad men, for it has long been the cheapest wheel in cost and by far the best, actual investment and scrap value considered. The addition of 1 per cent. of titanium alloy has the effect of making the metal closer grained, free from blowholes, stronger in flanges, rims, plates, &c. According to Booth, Garrett & Blair, chemists, of Philadelphia, the chemical change is merely a reduction in combined carbon of about 0.50 and an increase of graphite carbon of the same amount. This change reduces the chill somewhat, but improves its wearing qualities. This improvement is explained by the fact that the metal, being more free from impurities, heats less under the application of the brakes, and, therefore, has less expansion and contraction to strain it. A number of trial lots of wheels are in service, but owing to the long period required to fulfill the wheel guarantee sufficient time has not yet elapsed for a thorough demonstration. The condition of the wheels, however, has been noted from time to time, and freedom from chipping or cracks of any kind is very marked. The cost of the alloy in car wheels varies, of course, with the weight of the wheels, but may be said to add to the cost from 75 cents up to $2 per wheel only, including the wheel manufacturer's labor and profit. Stronger and safer metal and better scrap for remelting are some of the other advantages thus far noted in the use of titanium alloy in car wheels.

A trial of the alloy in iron, recently carried out by one of the largest corporations in the West, illustrates as plainly perhaps as anything which might be said one of the great contributing causes of the remarkable improvement which titanium gives in both steel and iron. The company referred to made a couple of iron ingot molds for use in making steel ingots and treated the iron with less than 1 per cent. of titanium alloy. These molds, when in use after dusk, could be picked out at once from all the other molds in service. The latter became red hot from the molten steel, while the two treated molds remained almost perfectly black. One of these molds was broken after it had made twice the service usually obtained from the ordinary mold, while the other treated mold is still in service and likely to last indefinitely. This fact of less absorption of heat and consequent less expansion and contraction is true of everything in which titanium is used. A treated casting heats less under the tool, a tool treated with titanium heats less while in service, and what is fully as remarkable is the fact that metal treated with this alloy is much more free from rust, since it removes all the oxides of iron, and "oxides are necessary for rusting," according to Prof. W. H. Walker of the Massachusetts Institute of Technology.

The Standard Sanitary Mfg. Company Enters Canada.

The Standard Sanitary Mfg. Company, Pittsburgh, Pa., in furtherance of its progressive policy, has made its entry on a large scale into Canada. The Standard Sanitary Mfg. Company, Ltd., of Canada, with $500,000 capital and the same officers that head the Pittsburgh company, has purchased the jobbing business and real estate of Somerville, Ltd., Richmond street, East, Toronto, as well as the jobbing business of the Labatt Mfg. Company and the General Brass Works. All three were well known factors in the plumbing supply business in Toronto.

The Standard Sanitary Mfg. Company, Ltd., will carry on the plumbing supply business on a very extensive scale, using the property formerly occupied by Somerville, Ltd., to which the stock of the other two companies purchased has been removed. The deal involved $250,000 cash, but the Standard Company will not stop there. The property purchased will be altered and remodeled, new offices installed and the showroom improved. In addition to a complete stock of general plumbing supplies, Standard green and gold label plumbing fixtures will be kept on hand, and the company intends to build a thoroughly modern factory in Toronto, the site for which has not yet been selected. The jobbing business in Toronto is under the management of W. A. Porter, formerly identified with Somerville, Ltd., as secretary and treasurer.

The Senate Tariff Bill.

Many Provisions of the Metal Schedule Adopted.

WASHINGTON, D. C., April 27, 1909.—The first reading of the Payne Tariff bill as amended by the Finance Committee was completed in the Senate on the 23d inst. under a somewhat unusual order of procedure. On the motion of Senator Aldrich and by unanimous consent the bill was taken up by paragraphs to enable the Senate to adopt the unamended paragraphs of the House bill and all the amendments made to the measure by the Finance Committee to which there should be no objection, with the understanding that any provision of the bill should be passed over, at the request of a single Senator, to be taken up for future consideration. Acting under this agreement the Senate adopted about two-thirds of the paragraphs of the metal schedule, the remainder going over under the objections of various Senators. The items passed over naturally include some of the most important features of the schedule, such as iron ore, pig iron, scrap iron and steel, wire rods and wire, automobiles, boiler tubes, cutlery, wire nails, screws, ferroalloys, lead and zinc products, &c. Notwithstanding the importance of the items passed over, the agreement reached on the schedules which were adopted represents important progress and, in connection with the completion of the first reading of the entire measure in three days, encourages the majority leaders to hope for the final passage of the bill and the adjournment of the special session not later than June 1.

When the metal schedule was taken up paragraphs 115½, iron ore, &c., and 116, pig iron, &c., were passed over on the request of Senator Du Pont of Delaware.

Rolled and Forged Iron and Steel.

Paragraphs 117 and 118, as amended by the Finance Committee, were then adopted as follows:

117. Bar iron, muck bars, square iron, rolled or hammered, comprising flats not less than 1 in. wide nor less than ⅝ of 1 in. thick, round iron not less than 7-16 of 1 in. in diameter, 3-10 of 1 cent per pound.

118. Round iron, in coils or rods, less than 7-16 of 1 in. in diameter, and bars or shapes of rolled or hammered iron, not specially provided for in this section, 6-10 of 1 cent per pound: *Provided*, That all iron in slabs, blooms, loops or other forms less finished than iron in bars, and more advanced than pig iron, except castings, shall be subject to duty of 4-10 of 1 cent per pound: *Provided further*, That all iron bars, blooms, billets, slabs or loops, in the manufacture of which charcoal is used as fuel, shall be subject to a duty of $8 per ton.

Paragraph 119, beams, girders and structural iron or steel, was passed over at the request of Senator Crawford of South Dakota, while paragraph 120, boiler and other plate iron or steel, went over on the objection of Senator Penrose of Pennsylvania. Paragraph 121, as amended, was adopted as follows:

121. Iron or steel anchors or parts thereof, 1 cent per pound; forgings of iron or steel, or of combined iron and steel, but not machined, tooled or otherwise advanced in condition by any process or operation subsequent to the forging process, not specially provided for in this section, 30 per centum ad valorem; anti-friction balls, ball bearings, and roller bearings, of iron or steel or other metal, finished or unfinished, 45 per centum ad valorem.

Paragraph 122, hoop, band or scroll iron or steel, went over at the request of Senator Oliver of Pennsylvania. Paragraph 123, cotton ties, &c., a House provision not amended by the Senate committee, was reopened at the request of Senator Simmons of North Carolina, and postponed for future consideration.

Paragraph 124, iron and steel rails, &c., not amended by the Senate, was adopted as passed by the House.

Paragraph 125, iron and steel sheets, a House provision not amended by the Finance Committee, was reopened at the request of Senator Scott of West Virginia, and put over for future consideration.

Paragraphs 126 and 127, as amended by the Finance Committee, was adopted as follows:

126. All iron or steel sheets or plates, and all hoop, band, or scroll iron or steel, excepting what are known commercially as tin plates, terne plates, and taggers tin, and hereinafter provided for, when galvanized or coated with zinc, spelter, or other metals, or any alloy of those metals, shall pay 2-10 of 1 cent per pound more duty than if the same was not so galvanized or coated; sheets or plates composed of iron, steel, copper, nickel, or other metal with layers of other metal or metals imposed thereon by forging, hammering, rolling, or welding, 40 per centum ad valorem.

127. Sheets of iron or steel, polished, planished, or glanced, by whatever name designated, 1½ cents per pound: *Provided*, That plates or sheets of iron or steel, by whatever name designated, other than polished, planished, or glanced herein provided for, which have been pickled or cleaned by acid, or by any other material or process, or which are cold rolled, smoothed only, not polished, shall pay 2-10 of 1 cent per pound more duty than is imposed by this section on common or black sheets of iron or steel.

Paragraph 128, tin plate, a House provision not amended by the Senate committee, was adopted. Paragraphs 129 and 130, as amended by the Finance Committee, were adopted as follows:

The Steel Billet and Bar Paragraph.

129. Steel ingots, cogged ingots, blooms, and slabs, by whatever process made; die blocks or blanks; billets and bars and tapered or beveled bars; mill shafting; pressed, sheared, or stamped shapes, not advanced in value or condition by any process or operation subsequent to the process of stamping; steel saw plates wholly or partially manufactured; hammer molds or swaged steel; gun-barrel molds not in bars; alloys used as substitutes for steel in the manufacture of tools; all descriptions and shapes of dry sand, loam, or iron-molded steel castings; sheets and plates and steel not specially provided for in this section, all of the above valued at ¾ of 1 cent per pound or less, 7-40 of 1 cent per pound; value above ¾ of 1 cent and not above 1 3-10 cents per pound, 3-10 of 1 cent per pound; valued above 1 3-10 cents and not above 1 8-10 cents per pound; 5-10 of 1 cent per pound; valued above 1 8-10 cents and not above 2 2-10 cents per pound, 6-10 of 1 cent per pound; valued above 2 2-10 cents and not above 3 cents per pound, 8-10 of 1 cent per pound; valued above 3 cents per pound and not above 4 cents per pound, 1 1-10 cents per pound; valued above 4 cents and not above 7 cents per pound, 1 2-10 cents per pound; valued above 7 cents and not above 10 cents per pound, 1 9-10 cents per pound; valued above 10 cents and not above 13 cents per pound, 2 3-10 cents per pound; valued above 13 cents and not above 16 cents per pound, 2 7-10 cents per pound; valued above 16 cents and not above 24 cents per pound, 4 6-10 cents per pound; valued above 24 cents and not above 32 cents per pound, 6 cents per pound; valued above 32 cents and not above 40 cents per pound, 7 cents per pound; valued above 40 cents per pound, 7 cents per pound; valued above 40 cents per pound, 20 per centum ad valorem.

130. Steel wool or steel shavings, 11 cents per pound, including the weight of wrappers and coverings.

The Senate agreed to the Finance Committee amendments striking from the bill paragraphs 131 and 132, which, as adopted by the House, read as follows:

131. Diamond steel, steel grit, diamond grit, iron form, iron sand, chilled iron sand, and similar articles by whatever name known, 45 per centum ad valorem.

132. The terms iron plates, steel plates, plate iron and plate steel, as used in this Act, shall be restricted to such articles having plane surfaces which may, however, be checkered, corrugated, or ribbed, for use as parts of constructions, but not as tools or implements in manufacturing.

Paragraph 133, wire rods, &c., was passed over at the request of Senator McCumber of North Dakota, at whose instance paragraph 134, round iron or steel wire, was also put over.

General Provisions.

The general provisions of the metal schedule as adopted by the House in paragraphs 135, 136, 137 and 138 were stricken out by the Senate at the suggestion of the Finance Committee, and the following substituted:

135. No article not specially provided for in this section, which is wholly or partly manufactured from tin plate, terne plate, or the sheet, plate, hoop, band or scroll iron or steel herein provided for, or of which such tin plate, terne plate, sheet, plate, hoop, band, or scroll iron or steel shall be the material of chief value, shall pay a lower rate of duty than that imposed on the tin plate, terne plate, or sheet, plate, hoop, band, or scroll iron or steel from which it is made, or of which it shall be the component thereof of chief value.

136. On all iron or steel bars or rods of whatever shape or section which are cold rolled, cold drawn, cold hammered, or polished in any way in addition to the ordinary process of hot rolling or hammering, there shall be paid ⅛ of 1 cent per pound in addition to the rates provided in this section on bars or rods of whatever section or shape which are hot rolled; and on all strips, plates, or sheets of iron or steel of whatever shape, other than the polished, planished, or glanced sheet iron or sheet steel hereinbefore provided for, which are cold hammered, blued, brightened, tempered, or polished by any process to such perfected surface finish or polish better than the grade of cold rolled, smoothed only, hereinbefore provided for, there shall be paid 4-10 of 1 cent per pound in addition to the rates provided in this section upon plates, strips, or sheets of iron or steel of common or black finish; and on steel circular saw plates there

shall be paid ¼ of 1 cent per pound in addition to the rates provided in this section for steel saw plates.

137. No allowance or reduction of duties for partial loss or damage in consequence of rust or of discoloration shall be made upon any description of iron or steel, or upon any article wholly or partly manufactured of iron or steel, or upon any manufacture of iron or steel.

138. All metal produced from iron or its ores, which is cast and malleable, of whatever description or form, without regard to the percentage of carbon contained therein, whether produced by cementation, or converted, cast, or made from iron or its ores, by the crucible, Bessemer, Clapp-Griffith, pneumatic, Thomas-Gilchrist, basic, Siemens-Martin, or open hearth process, or by the equivalent of either, or by a combination of two or more of the processes, or their equivalents, or by any fusion or other process which produces from iron or its ores a metal either granular or fibrous in structure, which is cast and malleable, excepting what is known as malleable iron castings, shall be classed and denominated as steel.

Manufactured Products.

Paragraph 139, anvils, as amended by the Finance Committee, was adopted as follows:

139. Anvils of iron or steel, or of iron and steel combined, by whatever process made, or in whatever stage of manufacture, 1⅝ cents per pound.

At the instance of Senator Bulkeley of Connecticut, paragraph 140, automobiles, bicycles, &c., was passed over. Paragraphs 141, 142, 143 and 144, as amended by the Finance Committee, were adopted as follows:

141. Axles, or parts thereof, axle bars, axle blanks, or forgings for axles, whether of iron or steel, without reference to the stage or state of manufacture, not otherwise provided for in this section, valued at not more than 6 cents per pound, ¾ of 1 cent per pound: *Provided*, That when iron or steel axles are imported fitted in wheels, or parts of wheels, of iron or steel, they shall be dutiable at the same rate as the wheels in which they are fitted.

142. Blacksmiths' hammers and sledges, track tools, wedges, and crowbars, whether of iron or steel, 1⅝ cents per pound.

143. Bolts, with or without threads or nuts, or bolt blanks, and finished hinges or hinge blanks, whether of iron or steel, 1½ cents per pound.

144. Card clothing not actually and permanently fitted to and attached to carding machines or to parts thereof at the time of importation, when manufactured with round iron or steel wire, 45 cents per square foot; when manufactured with plated wire or other than round iron or steel wire or with felt face, wool face, or rubber cloth face containing wool, 45 cents per square foot.

Paragraph 145, cast iron pipe, unamended by the Finance Committee, was adopted in the form as passed by the House. Paragraphs 146 and 147, as amended by the Finance Committee, were adopted as follows:

146. Cast iron andirons, plates, stove plates, sadirons, tailor's irons, hatter's irons, and castings and vessels wholly of cast iron, valued at not more than 2 cents per pound, ½ of 1 cent per pound; valued at more than 2 cents per pound, 35 per centum ad valorem. All castings of iron or cast iron plates which have been chiseled, drilled, machined, or otherwise advanced in condition by processes or operations subsequent to the casting process but not made up into articles, shall pay 2-10 of 1 cent per pound more than the rate imposed upon the castings of iron and cast iron plates hereinafter provided for.

147. Castings of malleable iron not specially provided for in this section, 7-10 of 1 cent per pound.

Paragraphs 148, cast hollow ware, and 149, chains of all kinds, unamended by the Finance Committee, were adopted as passed by the House.

Paragraph 150, boiler tubes, pipes, flues, &c., was put over at the request of Senator Penrose of Pennsylvania. At the instance of Senator La Follette of Wisconsin, paragraphs 151 and 153 of the cutlery schedule went over for further consideration, but paragraph 152, as amended by the Finance Committee, was agreed to as follows:

152. Swords, sword blades, and bayonets, 35 per centum ad valorem.

Paragraphs 154, files, and 155, muskets, muzzle-loading shotguns, rifles, &c., unamended by the Finance Committee, were adopted in the form as passed by the House.

Paragraph 156, double-barreled sporting breech-loading shotguns, rifles, &c., was also adopted with a slight verbal amendment in the form as passed by the House. The Senate agreed to the Finance Committee's amendment striking out section 157 of the House bill, which provided as follows:

157. Sheets, plates, wares, or articles of iron, steel, or other metal, enameled or glazed with vitreous glasses, 40 per centum ad valorem.

Nails.

Paragraphs 158 and 159, as amended by the Finance Committee, were agreed to as follows:

158. Cut nails and cut spikes of iron or steel, 4-10 of 1 cent per pound.

159. Horseshoe nails, hob nails, and all other wrought iron or steel nails not specially provided for in this section, 1½ cents per pound; horseshoe calks and parts thereof, finished or unfinished, of iron or steel, $7.50 per thousand.

Paragraph 160, wire nails, &c., went over at the request of Senator Oliver of Pennsylvania, as did also paragraph 161 at the request of Senator Crawford of South Dakota. Paragraph 162, unamended by the Finance Committee, was adopted as passed by the House. Paragraph 163, needles, &c., was passed over at the request of Senator Crawford. Paragraph 163½, a new provision framed by the Finance Committee, was adopted as follows:

163½. Fish hooks, fishing rods and reels, artificial flies, artificial baits, snelled hooks and all other fishing tackle or parts thereof, not specially provided for in this section, except fishing lines, fishing nets and seines, 45 per centum ad valorem.

Paragraph 164, steel plates engraved, stereotyped plates, &c., went over at the request of Senator Crawford. Paragraph 165, as amended by the Finance Committee, was adopted as follows:

165. Rivets, studs, and steel points, lathed, machined, or brightened, and rivets or studs for nonskidding automobile tires, 45 per centum ad valorem; rivets of iron or steel, not specially provided for in this section, 1¼ cents per pound.

Paragraph 166, saws, &c., unamended by the Finance Committee, was adopted as passed by the House. Paragraph 167, wood screws, went over at the request of Senator Crawford. Paragraph 168, umbrella and parasol ribs, &c., was passed over at the instance of Senator Dolliver of Iowa. Paragraph 169, wheels for railroad purposes, &c., unamended by the Finance Committee, was adopted in the form as passed by the House.

Metals.

Paragraph 170, as amended by the Finance Committee, was adopted as follows:

170. Aluminum, aluminum scrap, and alloys of any kind in which aluminum is the component material of chief value, in crude form, 7 cents per pound; in plates, sheets, bars, and rods, 11 cents per pound; barium, calcium, magnesium, sodium, and potassium, and alloys of which said metals are the component material of chief value, 3 cents per pound and 25 per centum ad valorem.

At the instance of Senator Crawford, paragraph 171, covering antimony and its products, was postponed for future consideration. Paragraph 172, German silver, unamended by the Finance Committee, was adopted as passed by the House. Paragraph 173, as amended by the Finance Committee, was adopted as follows:

173. Bronze powder, brocades, flitters, and metallics, valued at not over 20 cents per pound, 6 cents per pound; valued at over 20 cents per pound, 12 cents per pound; bronze, or Dutch-metal or aluminum, in leaf, 6 cents per 100 leaves.

Paragraphs 174, copper in all forms; 175, gold leaf, and 176, silver leaf, unamended by the Finance Committee, were adopted as passed by the House. Paragraph 177, as amended by the Finance Committee, was adopted as follows:

177. Tinsel wire, lame or lahn, made wholly or in chief value of gold, silver, or other metal, 10 cents per pound; bullions and metal threads, made wholly or in chief value of tinsel wire, lame or lahn, 10 cents per pound and 30 per centum ad valorem; fabrics, laces, embroideries, braids, galloons, trimmings, ribbons, beltings, ornaments, or other articles, made wholly or in chief value of tinsel wire, lame or lahn, bullions, or metal threads, 10 cents per pound and 60 per centum ad valorem.

At the request of Senator Bulkeley of Connecticut, paragraph 178, hooks and eyes, &c., unamended by the Senate Finance Committee, was reopened and put over for future consideration. Paragraph 179, lead ore, was postponed at the request of Senator Dolliver, while paragraph 180, lead bullion, pig lead, &c., went over at the instance of Senator Carter of Montana. Paragraph 181, as amended by the Finance Committee, was adopted as follows:

181. Metallic mineral substances in a crude state, and metals unwrought, whether capable of being wrought or not, not specially provided for in this section, 20 per centum ad valorem; monazite sand and thorite, 4 cents per pound.

At the request of Senator Burton of Ohio, paragraph 182, relating to ferroalloys, was passed over, and at the instance of Senator Brandegee of Connecticut, paragraph 183, relating to nickel, which was not amended by the Finance Committee, was reopened and put over. Paragraph 184, pens, unamended by the Finance Committee, was adopted as passed by the House. Paragraph 185,

metal penholder tips, as amended by the Finance Committee, was adopted as follows:

185. Penholder tips, penholders and parts thereof, 25 cents per gross and 25 per centum ad valorem; gold pens, 25 per centum ad valorem; fountain pens, stylographic pens, 30 per centum ad valorem; combination penholders, comprising penholder, pencil, rubber eraser, automatic stamp, or other attachment, 45 per centum ad valorem: *Provided*, That pens and penholders shall be assessed for duty separately.

Paragraph 186, pins, buckles, clasps, &c.; paragraph 187, quicksilver, and paragraph 188, type metal, unamended by the Finance Committee, were adopted in the form as passed by the House.

Senator LaFollette of Wisconsin objected to the consideration of paragraph 189, watch movements, and accordingly it was passed over, as were also paragraphs 190, zinc ore, and paragraph 191, pig zinc, &c., at the request of Senator Burton of Ohio. The Senate agreed to the Finance Committee amendment striking out the House provision, paragraph 192, which read as follows:

192. Alloys and other mixed metals in lumps, pigs, blocks, bars, cakes, sheets, or powder, not specially provided for, 20 per centum ad valorem.

Paragraph 192, a new provision reported by the Finance Committee, was agreed to as follows:

192. Cans, boxes, packages, containers, trays, signs, and similar articles, composed wholly or in chief value of tin plate, terne plate, or iron or steel sheets, if lacquered, enameled, or printed by any process of lithography whatever, all the foregoing, filled or unfilled, and whether their contents be dutiable or free, 4 cents per pound and 35 per centum ad valorem: *Provided*, That none of the foregoing articles shall pay a less rate of duty than 45 per centum ad valorem.

Paragraphs 193, 194 and 195, as amended by the Finance Committee, were agreed to as follows:

193. Bottle caps, if not colored, waxed, lacquered, enameled, lithographed, or embossed in color, 45 per centum ad valorem; if colored, waxed, lacquered, enameled, lithographed, or embossed in color, 55 per centum ad valorem.

194. Cash registers, linotype and all typesetting machines, machine tools, printing presses, sewing machines, typewriters, and all steam engines, 30 per centum ad valorem; embroidery machines and lace-making machines, including machines for making lace curtains, nets, or nettings, 45 per centum ad valorem: *Provided, however*, That all Lever or gouthrough lace machines, including machines for making lace curtains, nets, or nettings, imported prior to July 1, 1911, shall be admitted free of duty.

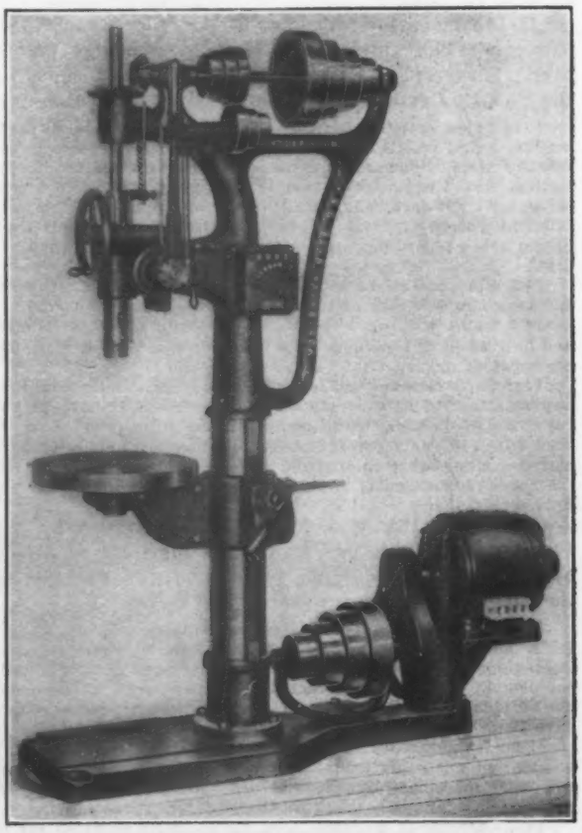
195. Articles or wares not specially provided for in this section, composed wholly or in part of iron, steel, lead, copper, nickel, pewter, zinc, gold, silver, platinum, aluminum, or other metal, and whether partly or wholly manufactured, 45 per centum ad valorem.

The consideration of the postponed items will necessarily proceed slowly, especially in view of the probable controversies regarding iron ore, steel sheets and plates, ferroalloys, the cutlery items, lead and zinc, &c., and it is, therefore, probable that several days will be required to dispose of the metal schedule. W. L. C.

The McCabe Machine Company's Right to Use Its Name.—An action brought by J. J. McCabe to restrain the McCabe Machine Company from using its corporate name was decided in favor of the latter April 17. Both parties to the suit are machinery dealers in New York City. J. J. McCabe has conducted his business for 22 years, making his name widely known in the machinery trade, and his brother, Peter A. McCabe, was in his employment until about December 16, 1908. Peter then withdrew from that connection and formed a corporation named the McCabe's Machine Company, to conduct the same kind of business. In deciding the case, the judge said: "If plantiff had done business under the name adopted by defendant, or even under the name of 'McCabe Machine Company,' perhaps he would be entitled to an injunction while the action is pending. But there can be no trademark at common law in a common word of the language, nor in one's own family name. The complaint does not charge actual fraud, except to infer that the use by defendant of said corporate name 'is a wrong and injury to the plaintiff and a fraud, actual or constructive, upon him or the public.' Bearing in mind that injunctions are extraordinary remedies and to be granted only when plaiutiff is entitled *prima facie* to recover, I am not convinced that one should issue on these papers. The designations 'J. J. McCabe' and 'McCabe Machine Company' may produce some confusion in the minds of buyers; but, in my opinion, neither is entitled to restrain the other."

The New Snyder 21-In. Drill.

The 21-in. power feed drill recently designed by J. E. Snyder & Son, Worcester, Mass., has been made specially powerful for driving high speed steel drills. The pulleys and cones are of large diameters and the construction is correspondingly heavy throughout. The machine will drill 1⅝-in. holes in machinery steel and 1¾-in. holes in cast iron. Using the lever feed with a ⅝-in. drill, under test it has drilled 8 in. deep in cast iron in 30 sec. The double worm power feed is driven by a cone pulley from the main top shaft. A handle pulls the worm into mesh, where it is held by a latch having a handle.



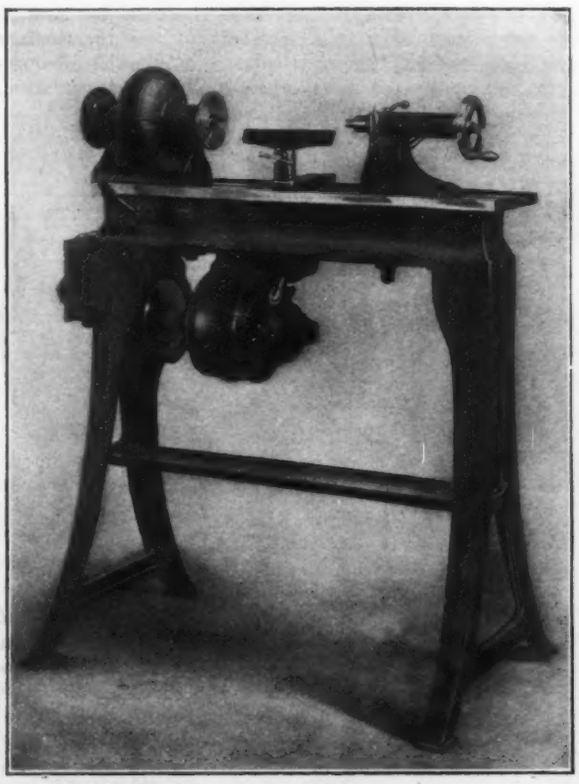
The New 21-In. Power Feed Drill Built by J. E. Snyder & Son, Worcester, Mass.

The power is stopped automatically at any required depth by an automatic stop, an adjustable vertical rod striking the latch and tripping it, disengaging the feed. The wheel and lever feed are combined.

The machine possesses the characteristic features of the Snyder type of drill. It drills to the center of a 21½-in. circle, the spindle has an automatic feed of 8½ in. and the table has a traverse on the column of 16½ in. The machine as shown is equipped with an electric motor. When belt drive is used the driving pulley has a diameter of 11 in. The cone pulleys give four changes of speed to the top shaft, from which three changes of feed are transmitted by a three-step cone pulley. The width of belt for the cone and driving pulleys is 2½ in. The speed of the lower shaft is 450 rev. per min. and the ratio of the bevel gears 3 to 2. The diameter of the spindle in the sleeve is 1½ in. and the hole in the spindle is a No. 3 Morse taper. Other dimensions are: Height from the floor to the top of the cone pulley, 72 in.; distance from the base to the spindle, 43½ in.; distance from the table to the spindle, 26 in.; diameter of the face plate, 17 in.; diameter of the main column, 6 in., and weight, 900 lb. One hp. is required for the drive.

A New Washburn Friction Driven Speed Lathe.

The principle of the friction drive, originally embodied in the sensitive drill built at the Washburn Shops of the Worcester Polytechnic Institute, Worcester, Mass., and described in *The Iron Age* April 2, 1908, has been applied to a speed lathe adapted for turning either wood or metals. The lathe is equipped with a constant speed motor, hung from the lathe bed at such an angle that it does not project in front and consequently cannot be in



A New Friction Driven Variable Speed Lathe for Wood and Metal Turning, Built at the Washburn Shops of the Worcester Polytechnic Institute.

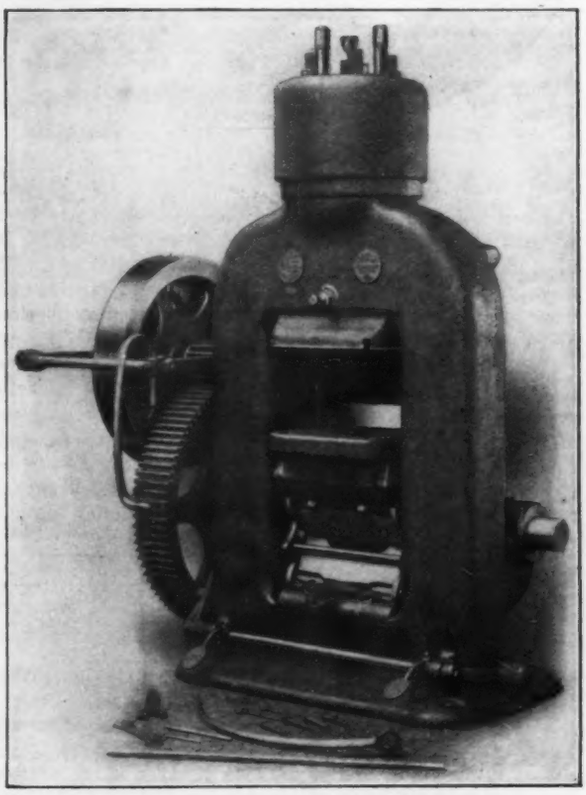
the way of the operator. The friction drives make possible the use of this type of motor, the various speeds being obtained by the double roll and disk friction, through which power is transmitted to the main spindle. The lever just beneath the headstock controls the speeds. It is attached to a segment gear meshing a rack cut in the roll carrier, the extreme movement of the rack being only 2 in. to obtain a range of speeds of over 4 to 1. The sliding of the rolls across the disk is easily accomplished, as there is slight normal pressure on the rolls except when the machine is working, pressure being controlled automatically by a cam clutch, which acts as a positive drive or tightener and increases or decreases the pull of the disk on the work directly as the work requires. Without stopping the motor the spindle may be stopped by throwing the speed lever to its extreme position; this moves the driven roll to the center of the driving disk, which is recessed to break the contact. In this way the motor may be started without load. Thus there is instant control of speed variation; the starting and stopping of the lathe is independent of the motive power; there is automatic control of the power transmitted from the driving shaft, so that power is consumed only as it is needed, and there is full efficiency for the slower speeds through the use of the constant speed motor.

The disk on the spindle is entirely inclosed by the headstock and a removable cap. A hand wheel on the end of the spindle is provided to stop the spindle when the power is cut off and to rotate it while setting or examining the work. There are no belts. The motor runs at 1800 rev. per min., and the drive is designed to give a speed variation of the spindle ranging from 600 to 2650 rev. per min. When intended for metal working the machine is arranged for slower speeds and is furnished with draw-in chucks and a slide rest. It may be fitted with either a direct current or induction motor, and a special single phase motor may be used whereby the lathe can be run from the ordinary lighting circuits, making it of special value for house or garage use.

A New Ferracute Deep Drawing Press.

A press intended for drawing and forming shallow work up to 20 in. in diameter and 1 in. deep in 1-16-in. sheet steel was recently built by the Ferracute Machine Company, Bridgeton, N. J., from designs of Oberlin Smith, the president and mechanical engineer of the company. The forming operation required considerable pressure, as the heavy sheet metal had to flow or be "coined," which explains why a press of the coining type was used. The distance between columns is greater than in an ordinary coining press, but notwithstanding this fact the machine is smaller and more compact than the conventional drawing press in which work of this nature is usually performed. The ram is forced upward by powerful steel toggles at the back of the press and has a stroke of 2 in. The pressure exerted by the ram when it reaches the top of its stroke is 450 tons.

A noticeable feature is the spring holding and clamping attachment shown on the top of the press in the illus-



A Deep Drawing Press of the Coining Type, Built by the Ferracute Machine Company, Bridgeton, N. J.

tration. A number of heavy steel springs encased therein exert a total pressure of 60 tons on a steel spindle or stem that projects centrally down through the head. This stem (corresponding to the blank holder of a drawing press) may have as much vertical motion as the ram, but, as shown in the engraving, is adjusted for a motion of 1 in. An adjusting wedge is interposed between the head and the upper part of the frame; the head is adjusted vertically by means of the bolt shown just above it, which bolt moves the wedge in and out. An effective friction clutch of modern design connects the flywheel to the shaft when the treadle is depressed; the clutch is automatically disconnected at the end of the stroke unless the treadle is locked down. The columns are solid and each has a sectional area of 13 x 14 in. The press occupies a floor space of 54 x 108 in., is 110 in. high and weighs 22,500 lb.

The Reeves Roller Thrust Bearing.

Some 12 years ago the Reeves Pulley Company, Columbus, Ind., placed on the market the Reeves variable speed transmission. This machine has in the interval been developed in several details. Chief among the improvements needed was an antifriction thrust bearing capable of heavy and continuous service. After testing various bearings on the market and finding none seeming to meet the requirements, the company began experimenting with a bearing of its own. Its experience indicated that rollers were more durable than balls, and that large rollers were better than small ones, provided that they could be held in perfect and true axial relationship. This the company claims to have accomplished, and after severe tests, extending over several years, decided to place this bearing on the market for general service.

Fig. 1.

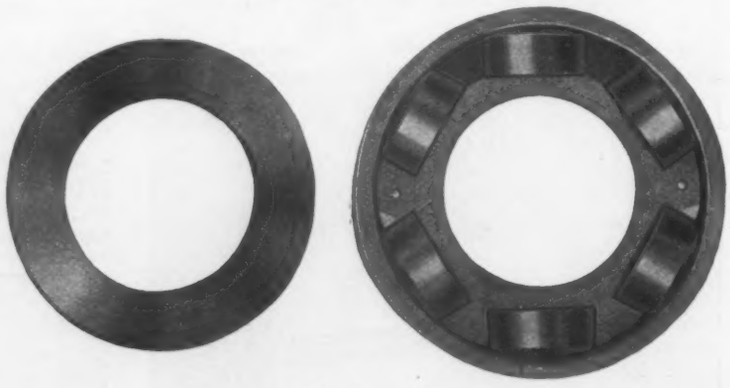


Fig. 2.

The Anti-Friction Thrust Bearing Made by the Reeves Pulley Company, Columbus, Ind.

The bearings are so constructed that the rollers are held perfectly true at all times, not only when the bearing is new, but as long as there is a piece of the roller left, and therein lies the secret of the success of the bearing, as when the rollers are held true there is minimum friction and long life and high efficiency.

Fig. 1 shows the bearing assembled, and Fig. 2 shows it with one raceway removed. The hardened steel rollers at one end are convex so as to conform to the circle of the cast cup with which they contact in running, and this holds the rollers true at all times. The rollers continually change their position in the cup, thus preventing the cup from wearing out of true, even though it should wear larger. The spacing cage is made of bronze, and has no other function than to separate the steel rollers.

There are two hardened steel raceways which fit into the cast cup and against which the rollers run. One of these raceways is bored large, so that it will not come in contact with and cut the shaft. The other raceway and the cast cup revolve with the shaft so they have no tendency to cut it, and these are bored to fit the shaft snugly, thus holding the entire bearing central.

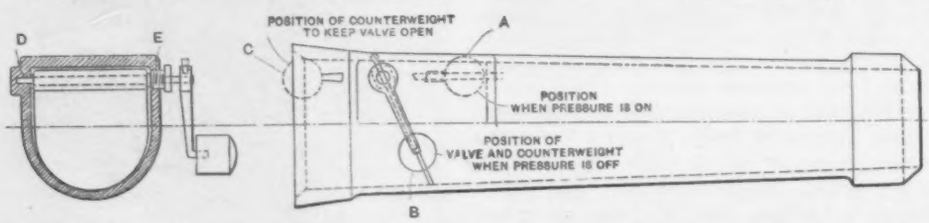
To assemble the bearing the raceway with the large bore is placed in the cast cup first, then the spacing cage is put in place, and the rollers inserted with the rounded ends next to the cast cup, after which the other raceway is put in and the bearing is ready for service.

The plant of the Standard Steel Car Company at Butler, Pa., is again in partial operation, after a shutdown of about nine months. Orders secured for steel cars will enable it to run partially full for the next two or three months.

The Shutts-McHugh Automatic Blow Pipe Valve.

S. B. Shutts and Wm. McHugh of the blast furnace department of the Joliet Works of the Illinois Steel Company have invented and applied to practice a new automatic blowpipe valve designed to obviate some of the dangers and annoyances incident to the operation of blast furnaces. The device consists of an ordinary furnace valve so arranged as to automatically close when the blast is stopped from any cause, such as back pressure in the pipes produced by heavy slips in the furnace. An additional feature is the provision of means for holding the valve open when it is necessary to stop the furnace and draw the gas. The construction and manner of operation are indicated in the accompanying illustration, showing a side elevation and cross section.

The section of the pipe containing the valve is shaped to accommodate its movements, being constructed in the form of a flat topped trough. On the shank of the spindle supporting the flap is a counterweighted lever, tending normally to hold the valve closed. The several positions of the counterweight corresponding to the fixed and movable positions of the valve are shown in the drawing. When the blast is on, the valve is held against the top of the pipe and the counterweight is at A, from whence it drops to B upon release of the pressure. When it is desired to secure an unobstructed opening through the pipe for the purpose of drawing the gas the counterweight may be shifted with respect to the flap through 180 degrees, and when in the position C will hold the flap in a horizontal or open position. Besides affording a clear view into the tuyere, the open passageway secured by the use of this valve offers no interference to the poking out of the tuyere with a bar.



Cross Section and Side Elevation of the Shutts-McHugh Automatic Blast Furnace Blow Pipe Valve.

In providing bearings for the valve spindle only one opening is made in the pipe, as will be seen in the cross section; the inner end of the flap shank is supported in the recess D and the other end passes through a leakproof bearing, E, constructed without the use of packing.

Because the mechanism in the pipe might suffer injury from being dropped to the floor if it was taken down in the usual way a special apparatus has been designed to overcome this difficulty. It consists of a steel incline on which the pipe is skidded to the floor without unnecessary jar. This valve has been tried out in several months of actual service on one of the furnaces of the Joliet group, where it is said to have withstood the severest tests of heat and abrasion of the blast and cinders. It has been found that it not only prevents the

coke from filling up the blowpipe, but also relieves the necessity for blowing out coke through the peep holes, which tends to wear the bearing faces and cause wind leaks that to be repaired necessitates stopping the furnace blast. As a result of the satisfactory experience in the tests made other furnaces of the Illinois Steel Company, including those at South Chicago, are being equipped with this valve.

The Geological Survey Opens a Branch Office at Denver.

The United States Geological Survey has just opened at Denver, Colo., a permanent branch office to facilitate the transaction of its Western work. It thus provides a base of supplies for the large corps of engineers who are kept in the field many months each year, making geologic studies of mineral deposits, conducting detailed topographic surveys for the base maps of the geologic atlas of the United States, mapping the great national forests, investigating surface and underground waters, and collecting statistics of mineral production.

The establishment of such a branch office, however, would have little outside interest if its only purpose was to serve the convenience of the survey corps, but it is designed also to meet the great need of the Western public for a source of information less remote than Washington. A supply of copies of the publications available for free distribution will be kept on hand, as well as a complete file of the topographic maps, geologic folios and other publications of the survey subject to sale. All of these publications will be open to inspection by persons desiring information concerning the subjects treated. Prospective purchasers of maps and folios will be referred to the nearest sales agent, and the free publications will be distributed in Denver to those making application. In short, the Denver office is intended to serve the public in all matters that lie legitimately within the province of the United States Geological Survey.

The office is located in the Commonwealth Building. R. C. Miles, special disbursing agent, is at present in charge, and will answer all inquiries, distribute documents and maintain a visitors' register.

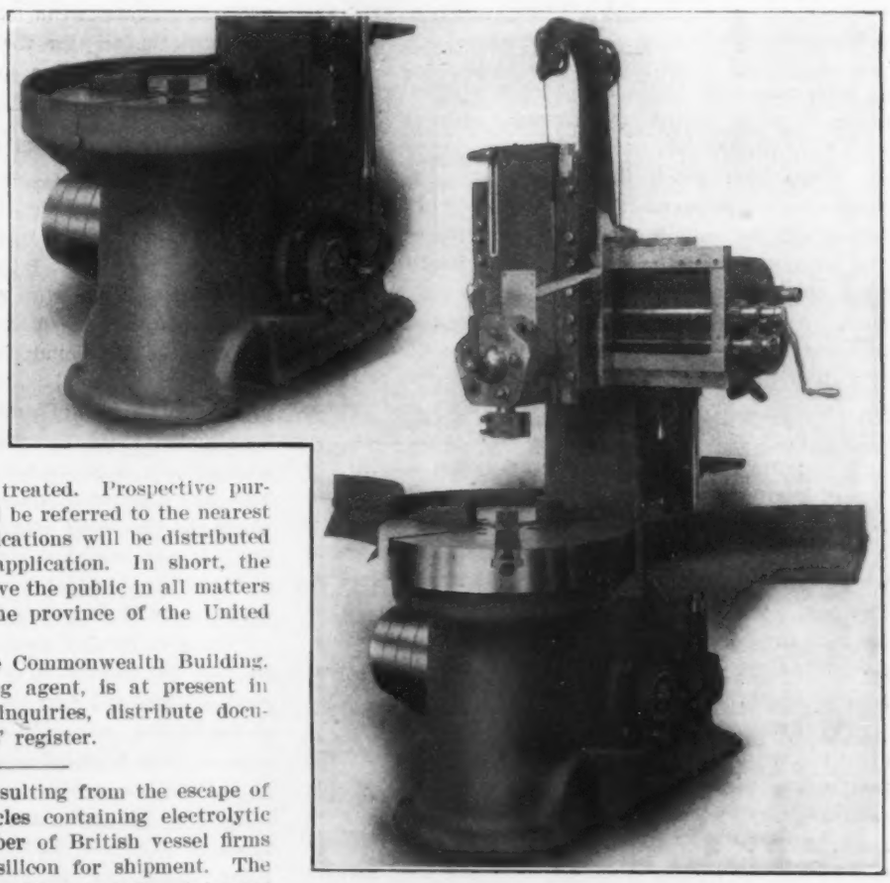
In view of the fatalities resulting from the escape of poisonous gases from receptacles containing electrolytic ferrosilicon in transit, a number of British vessel firms have refused to receive ferrosilicon for shipment. The British Board of Trade has, therefore, issued a statement saying that on inquiry it learns that low grade ferrosilicon made in the blast furnace is not dangerous. It adds that no objection need be raised to the shipment of this kind of ferrosilicon, provided each consignment is accompanied by a certificate from the maker or shipper to the effect that it is low grade ferrosilicon made in a blast furnace, and contains not more than 15 per cent. of silicon.

The *Herald* of New Britain, Conn., in its issue of April 21 gives interesting interviews with Philip Corbin, president of the American Hardware Corporation; C. M. Jarvis, vice-president of the same corporation and a director of the National Association of Manufacturers, and Isaac D. Russell, vice-president and treasurer of the Russell & Erwin Mfg. Company. All these gentlemen are strong protectionists and all are heartily in favor of a tariff commission. Their views are set forth at length, indicating that each has given much thought to the subject.

The Colburn Boring Mill Table Guard.

In machining such metals as steel and aluminum it is often advantageous to use lubricants, such as oil, water, kerosene, &c., and it is common in lathe and screw machines to provide means for taking care of these liquids. In doing some kinds of work in the vertical boring mill there exists the same necessity for using lubricant, but it is not so easy to make suitable guards to keep the liquid within bounds. Such a device to be satisfactory must extend above the highest and below the lowest part of the chuck or table, must be so designed so that it will not be in the way of the wrench used in clamping or unclamping the work in the chuck, and must not interfere with the placing of work or taking it off. All of these requirements are met by the device manufactured by the Colburn Machine Company, Franklin, Pa., and shown in the illustration applied to one of its 34-in. vertical boring mills.

The guard consists of four pieces. Two supporting brackets are bolted to the frame of the machine, one on each side. These brackets form part of the guard and are of the same shape as the front part. The stationary



A Lubricant Retaining Guard Applied to a 34-In. Colburn Boring Mill Table.

brackets encircle one-half of the entire table or chuck, and at their outer ends have hinged to them the front sections of the guard. These two front sections, or wings, are adapted to swing out and back, as shown in the illustration. When in open position the chuck is perfectly accessible for opening and closing the jaws, and for putting on and taking off work.

When closed, as shown in the detail, the two wings are locked together by a latch operated by the handle or knob in front. A suitable trough made of sheet metal can be attached underneath the guard to drain off the lubricant and catch the chips, or the chips and lubricant can be allowed to fall to the floor into a large pan under the entire base of the machine. By using a large pan of this kind all the lubricant and chips falling from the guard, as well as through the hollow spindle, can be caught and by means of a pump carried back to the work again.

THE IRON AGE

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Dumping Abandoned by American Steel Makers.

Some weeks ago English newspaper writers, with adequate access to international channels of news distribution, were thrown into one of those spasms over American competition which the knowing ones watch with complacency. It seems that the Glasgow Corporation opened bids for rails for the municipal tramway system and made the startling discovery that English makers were outrageously underbid by the wicked American trust. Another one of those sudden raids upon a defenseless British industry from behind the Chinese tariff wall of the United States. Another startling proof of the decadence of British enterprise! With one savage cut $10 per ton is lopped off the price of steel rails.

It appears that the Glasgow Corporation wanted 250 tons of guard rails of standard section which the Lorain Works had furnished in quantities to tram roads in different English colonies and in other parts of the world where such enterprises are controlled by English capital. The next lowest English bidders evidently did not have the rolls turned, and added the cost thereof to the figure for rolling the little 250 ton lot, thus reaching a unit price of £8 10s.

The little incident, however, was twisted into an event of international significance, and is worthy of mention chiefly because it affords an opportunity for discussing a very serious phase of the world's iron and steel markets. Ever since the acknowledgment that co-operation among the leading American iron and steel makers was under a cloud as a market policy, the Europeans have been under the highest nervous strain in the fear of another sensational American invasion. They have been expecting "dumping" on a colossal scale at unprecedentedly low figures. Such occurrences have taken place in the past, under similar circumstances, so that the desperate competition in our home markets must spread to neutral territory again. Some encouragement might be given to that fear by the fact that in certain finished products the prices now ruling in this country are lower than those which prevail in some of the world's markets. In some countries, like Cuba, Mexico and Canada, where our makers have advantages over European producers, sharp rivalry among American steel works have brought out prices quite as low as, if not lower than any made under stress of competition here.

But the great steel works of this country have not shown the slightest disposition to sweep the markets clean of all work in sight, with an utter disregard of prices. Foreign business has been systematically cultivated during the past few years along conservative and reasonable lines, and has not been created by a cut-throat policy. Competition has been met, as determined by the conditions affecting each particular market and each particular commodity. Where foreign makers of finished goods have been too strongly intrenched, they have been left to the enjoyment of their markets, and have become the customers of the American steel makers for a part of their requirements of crude or semifinished material. The consistent effort has been to secure full market values, establish permanent relations and protect the business thus acquired. It has been thoroughly established as a selling policy that raiding is a short-sighted course which can only be justified under the most extraordinary circumstances. The sooner this is clearly understood in Europe the better it will be for all concerned. Consumers of iron and steel all over the world will do well to extend their inquiries to our producers, but they will be disappointed if they labor under the impression that American makers are going to throw their steel away merely for the sake of making the pace hot for the sellers of other countries.

Wire Products and Rails in 1908.

The statistics of the American iron trade for 1908, just published by the American Iron and Steel Association, make possible an interesting comparison of the production of rails and wire rods. The growth of wire consumption in the United States has been so marked as to call out the occasional observation that the year may come when the total of wire products will exceed the production of rails. Encouragement for such a view has been given by the fact that the wire trade has shown good activity in years when railroad demand fell away. This was illustrated in a striking way in 1904, a year in which the wire mills were busier than those in any other line. It was remarked when the statistics of that year were published that the wire rod output showed unexpectedly an increase upon that of 1903. Whereas the output of all finished steel and iron products in 1904 fell off 1,200,000 gross tons, or nearly 10 per cent., from the total of 13,207,697 tons in 1903, wire products, as represented by the production of wire rods, increased 13 per cent., or from 1,503,545 tons to 1,699,028 tons.

In 1908 the production of wire rods in the United States was 1,816,949 tons, whereas the production of all kinds of rails was 1,921,611 tons, a difference of only 105,000 tons. As the following table shows, this was the closest approximation of the two products in the history of the iron trade. We go back to 1898, the year in which wire rods crossed the 1,000,000-ton line:

Production of Wire Rods and Rails.—Gross Tons.

	Wire rods.	Rails.
1898	1,071,683	1,981,241
1899	1,036,398	2,272,700
1900	846,291	2,385,682
1901	1,365,934	2,874,639
1902	1,574,293	2,947,933
1903	1,503,455	2,992,477
1904	1,699,028	2,284,711
1905	1,808,688	3,375,929
1906	1,871,614	3,977,887
1907	2,017,583	3,633,654
1908	1,816,949	1,921,611

The close approach of the wire rod and rail tonnages last year is the more striking in view of the fact that the average rail output in 1905, 1906 and 1907 was substantially twice the average wire rod production in the same three years. Apart from those of 1900, which re-

flect the blow given by the sensational reductions in wire prices, with shutting down of plants in April of that year, the wire rod figures show a generally steady and healthy growth, contrasting in 1904 and 1908 with those of an industry dependent upon the financial operations of the railroads. Wire rods, in a word, reflect the soundness and dependability of our magnificent agricultural industry.

Railroad Rebate Cases.

A Federal grand jury which for several months has been hearing evidence at Chicago involving charges of rebating against large shippers adjourned last week without returning any indictments. All the companies operating blast furnaces in Chicago were under investigation in one of these cases, growing out of rates on limestone from a quarry in Indiana to Chicago, but the searching inquiry to which they were subjected failed to show that there had been any intent to evade or violate the law. The disposition of this case may throw a little light on the policy of the new Administration in dealing with alleged violations of the interstate commerce law. The tariff in this case was an old one, filed in 1895 with the Interstate Commerce Commission, and made a rate of 40 cents per ton on stone in trainloads and 65 cents per ton in carloads. The quarry was situated several miles from the railroad, on a spur, and the trainload rate was made because it was cheaper to send an engine and crew after a full train than to make the same movement for one car. The Government investigators claimed there was a technical violation of the law, and a few years ago this would have been sufficient to justify an aggressive prosecution; but in this case the matter has been referred back to the Interstate Commerce Commission, with other doubtful cases that have been under investigation.

The Government has at its command for the enforcement of the interstate commerce law two great agencies, the Department of Justice and the Interstate Commerce Commission. Through the efforts of the Department of Justice a railroad company or a shipper is indicted by a federal grand jury, brought to trial and fined if convicted. The Elkins law abolished the penalty of imprisonment but the Hepburn law revived this feature, and, in addition to the fines that may be levied against a corporation, the individual involved in a violation of the law may be imprisoned for not more than two years. There have been no cases thus far under the Hepburn law in which shippers or railroad officials have been sentenced to imprisonment, but nearly all the trials of corporations have resulted in conviction and heavy fines. Until a few years ago the business of the Department of Justice was confined almost entirely to the enforcement of the revenue laws and laws relating to the currency or banking. Owing to the long experience of the law officers of the Department, and their expert knowledge of practice in the federal courts, the criminal brought to trial seldom escapes the penalty of his offense. When this highly efficient arm of the Government was brought to bear on prosecutions under the Elkins law against corporations which cannot appeal to any sympathy in the mind of the juror, it produced spectacular results. There has been only one notable case where the prosecution has failed to bring down the quarry, and in this case the jury acted under order of the court.

In the Interstate Commerce Commission the Government possesses an agency of a vastly different character. When the commission discovers a railroad tariff or any practice that is irregular or in violation of the law, or when a complaint is filed calling attention to any such irregularity, the railroad is notified by an ordinary business letter, and the trouble is promptly corrected, either by amending or reissuing the tariff, or by discontinuing any practice which the commission considers irregular. The commission does not prosecute any one, and, except in rare cases, it forgets the past and looks only to the future. In hundreds, perhaps thousands, of cases of this character an ordinary business communication from the commission calling attention to the facts has done as much in the interest of justice as a true bill from a federal grand jury. The commission employs a staff of examiners who have the same authority to examine all the books and records of a railroad as a bank examiner to investigate a national bank. It is useless to resist the mild authority of the commission, because in the background are to be seen the Department of Justice, the dreaded secret service and a federal court and jury. The railroad officials have gracefully accepted the inevitable, and a mere letter from the commission has become law to them. The Department of Justice provokes protests that capital is being persecuted whenever it brings a corporation into court; and if the corporation gets away there is clamor of a more ominous character from the multitude that the court was bought off. Meantime, the commission goes on quietly disposing of hundreds of cases with less effort than is required in one criminal prosecution.

It must be confessed, however, that the form of government which the commission represents is a remarkable innovation. It is abhorrent to the spirit of the common law for officials charged with the execution of law to exercise any "dispensing" power, or to overlook offenses in consideration of a promise of good behavior for the future. A convict after serving a part of his term is sometimes, under statutory regulation, released on parole of ticket of leave, which makes his conduct for a certain period subject to supervision by the authorities. The commission, however, keeps the corporations subject to its jurisdiction under a form of perpetual parole, and then stands over them and dictates in minute detail how the business shall be managed. No king or emperor ever exercised so great a power over the affairs of his subjects, nor accomplished the feat of getting all his subjects under a perpetual parole. Thus far the commission has been inspired solely by a desire to promote right and justice; but is this the beginning of a new form of government for corporations?

A Widely Prevalent Optimism.

It was said in *Dun's Review* last week that "faith in the future is more pronounced than satisfaction with immediate conditions, and there is no more noteworthy feature of the trade outlook than the steadily growing confidence that with the tariff discussion out of the way and with the year's principal crops assured the progress toward a full industrial prosperity will be rapid." It is of no small significance that optimism has been an unfailing factor in commerce and industry throughout the depression beginning late in 1907. In this particular the contrast with all preceding depressions has been marked. For several years following 1893 the gloom and apparent hopelessness of the situation were frequently commented on in trade reviews. There seemed no solid ground. It was conceded on all hands that many things required to be cured before there could be any hope of financial health.

On the other hand, apart from the weeks immediately following October, 1907, when business staggered under the stunning blow to confidence, there has been no time in the last 18 months when the spirit of hopefulness has not been abroad in the United States. This condition has contrasted sharply with the pessimism expressed in reviews and forecasts of British trade in the same period. Faith in the abundant future of American industry seems not to have been shaken by any development of the recent depression. One drawback has been, in fact, that at times some interests have been too impatient of the delay in realizing their hopes. But the false starts due to such optimism have not been disastrous; they have only emphasized the fact that slow paced recovery is surest. Those who take the view that the psychological factor is a large one in all depression certainly have had nothing to complain of in the mental attitude of the great majority of financial and industrial leaders in this latest period of stress. In a gratifying way belief in the approach of improvement has prevented a drastic curtailment of expenditure in the average business.

CORRESPONDENCE.

The Railroad Tie Question.

To the Editor: In *The Iron Age* of April 15 appears an article entitled "The Tie Plate and the Steel Tie," in which the author endeavors to show that, by reason of the interest cost on the investment, there is comparatively little or no economy in the use of steel ties over that of wooden ties with tie plates. We cannot agree with the conclusions arrived at by the writer of this article, for the following reasons:

1. The article ignores one of the great objects to be obtained by the use of steel ties, namely, the preservation of our forests from the enormous consumption due to timber cut for ties, and which consumption is increasing at a much greater rate than the natural growth and reproduction of the forest.

2. He fails to note that the preservative in general use for prolonging the life of the wooden tie—creosote—is itself a product of the forest, it being obtained from wood tar, and is itself another factor in hastening the destruction of our forests.

3. Will his plan of "preserving" the wood tie work out in actual practice? We will all readily admit that the white oak or rock oak tie of 15 or 20 years ago, a tie 7 in. x 9 in. x 8 ft. 6 in. was better for railroad purposes than any metal or concrete tie, but the time when those ties could be obtained is past, and the oak tie of to-day will not last one-half as long as that of 15 or 20 years ago.

Moreover, a white or rock oak tie cannot be successfully treated with any preservative known at the present time. The creosote, which is the active principle in most if not all the preservatives used, will not penetrate through the entire tie, but only for a very short distance from the surface. This leaves available only the red, black, pin and other porous oaks, chestnut and other soft woods, to be used for ties if treated. In treating a tie with preservatives, all sap and moisture must first be forced out of the wood, and the creosote then forced into the pores of the wood under pressure and generally under a steaming process. This treatment will preserve the tie from rotting, but at the same time it takes all life and elasticity out of the tie and it becomes softer, more brittle and the base of the rail or the tie plate will cut into the tie faster and wear it out sooner. In addition to this, owing to the lack of elasticity in the wood fibers after such treatment, the particles do not grip the spike and hold it so tenaciously as in the case of an untreated tie. The result is that the pounding of traffic soon loosens the spikes and the rails must be respiked.

Again, no porous or open growth oak or soft wood tie, even if treated with a preservative, will average a life of 15 years on curves and tangents, as the tie will not stand the respiking necessary to keep the rail in gauge.

RELATIVE COST OF STEEL AND WOOD TIES.

4. We cannot agree with the estimate of the relative cost of steel and wood ties as given in said article, even assuming that the figures therein are correct. For example:

Cost of oak tie	$0.85
Treating same	.15
One pair tie plates	.25
Spikes	.10
Total first cost	$1.35
Add 6 per cent. interest 10 years	.81
Cost for first 10 years	$2.16
Cost for second 10 years	2.16
Cost for third 10 years	2.16
Cost of three removals and replacing at 25 cents each	.75
Cost at end of 30 years per tie	$7.23
Cost of steel tie and rail fasteners complete	$3.00
Life of same, 30 years.	
6 per cent. interest for 30 years	5.40
Total cost	$8.40
Less scrap value at end of service	1.68
Net cost	6.72
Saving in 30 years per tie in favor of steel	$0.51

These figures are based on the assumption that the statements as to life of wood ties as given in said article are correct, and on the present average price of a wood tie (85 cents) and which price is increasing rapidly. But will any practical railroad man believe that the average wood tie of to-day, whether treated or not, used with tie plates or any other device laid in cinder, rock, gravel or sand ballast, will last on the average over seven years on curves and straight track? Put the question to any practical railroad man of experience and get his reply, and not to either the tie plate man or the steel tie man. Take the life of the tie at seven years, for the average of the wooden tie, and compare the results:

Wood tie cost	$0.85
Treatment	.15
Tie plates	.25
Spikes	.10
Interest at 6 per cent for seven years	.567
Cost first seven years	$1.9170
Cost second seven years and labor renewal	2.1670
Cost third seven years and labor renewal	2.1670
Cost fourth seven years and labor renewal	2.1670
Cost for two years	.6191
Total cost wood tie in 30 years	$9.0371
As against steel tie	6.7200
Saving on steel tie in 30 years	$2.3171

These figures are also based on the assumption that the present cost of 85 cents each for the wooden tie will remain. Compute this for a mile of single track, ties spaced 2 ft. centers, or 2640 ties per mile, and you have for each mile of track a saving of $6116.88—no inconsiderable item for a single mile of track in 30 years.

Now while the question of the life of a steel tie has not been determined by experience in this country, it has in Holland. Chief Engineer Post of the Netherlands State Railway found that steel ties weighing when first installed 125 lb. had in 35 years of constant use lost but 8¾ lb. in weight, and were still good for 20 years' service. This claim of 55 years' life for a steel tie is ample evidence that an estimate of 30 years in this country is a very conservative one.

THE ENORMOUS QUANTITIES INVOLVED.

We assume, by your estimate, that there are 325,000 miles of standard steam railroad tracks now in existence, with 2640 ties to the mile, or 958,000,000 ties in all. If you take as a unit the standard 7 in. x 9 in. x 8 ft. 6 in. tie, which contains 44.63 ft. board measure of lumber, you have used up in equipping this mileage the enormous quantity of 42,755,540,000 ft. of lumber. Think what the value of that amount of lumber for other uses would be at the present market price of $26 per 1000 ft., and this has to be renewed every seven years. These figures are based on the present price of wood ties, but as the forests become more and more depleted the price of wood ties must and will increase year by year, and in 10 years from to-day a conservative estimate of the cost of wood ties will not be less than $1.50 per tie, and even at that price we doubt if the demand could be supplied; first, on account of the scarcity of the tie timber, and, second, because the lumber in the tie would be worth more money for other purposes. Replace these wood ties by steel, and compute the saving in 30 years of $6116.88 per mile times 325,000 miles, or $1,987,986.

But are railroad men the only ones interested in seeing the steel tie come into use? By no means. Look at the tonnage it would create for the steel men to manufacture, the laborer to manufacture and the railroads to haul: 2640 ties per mile, weighing 150 lb. each, or 396,000 lb., or 198 tons per mile, or for ties alone for total trackage the enormous amount of 64,350,000 net tons. Add to this the fasteners for the same 3,432,000 net tons and you have the enormous total of 67,782,000 net tons of steel. What this would mean to steel manufacturers who are now looking for new fields for their products can best be explained by the steel men themselves.

In view of all the foregoing considerations, it seems to us that a true economy, a wise far-sighted policy, must and will lead our railroad men to investigate carefully the claims of steel tie manufacturers, and to adopt that which is best fitted to answer the requirements of railroad purposes.

GEO. M. COTE & CO.

PITTSBURGH, April 20, 1909.

The Cincinnati Convention of the American Foundrymen's Association.

The secretary, Dr. Richard Moldenke, has published the provisional programme for the convention of the American Foundrymen's Association at Cincinnati, May 18, 19 and 20. The American Brass Founders' Association meets at the same time and place, and it has been decided to hold the sessions of the two organizations jointly. Heretofore there have been separate sessions for the reading of papers and members of one association have often been compelled to forego participation in the discussions of papers of interest to them which were presented in the other. The Associated Foundry Foremen hold their annual convention on Monday, May 17, and the members will remain for participation in the sessions of the other two associations. The programme of the five sessions of the iron founders and brass founders, which will be devoted to the reading of papers, is arranged as follows, by Secretaries Moldenke and Corse:

OPENING SESSION, TUESDAY, MAY 18, 2 P.M.

Addresses of welcome and responses.

Presidential address, L. L. Anthes, American Foundrymen's Association.

Presidential address, Chas. J. Caley, American Brass Founders' Association.

Report of Secretary W. M. Corse, A. B. F. A.

Report of Treasurer J. H. Sheeler, A. B. F. A.

Report of Secretary-Treasurer Richard Moldenke, A. F. A.

Report of Committee on Standard Specifications for Foundry Pig Iron.

Report of Committee on Prevention of Accidents in Foundries.

Reports of Auditing Committees and of committees of the A. B. F. A.

WEDNESDAY MORNING, 10 O'CLOCK.

Papers of the A. B. F. A.:

"The Manufacture of Brass Ingots—Uses and Advantages," by W. M. Corse.

"The Use of Waste Heat," by F. W. Reidenbach.

"The Patent Situation in the United States Respecting Alloys," by C. H. Clamer.

Papers of the A. F. A.:

"The Cost of Steel Melting in Foundries," by Dr. Bradley Stoughton. Illustrated by lantern slides.

"The Side Blow Converter for Steel Castings and Its Operation," by J. S. Whitehouse.

"Open Hearth Methods for Steel Castings," by W. M. Carr.

"Notes on Air Furnace Construction for Malleable Castings," by W. H. Kane.

"The Use of Pulverized Coal for Foundry Purposes," by Richard K. Meade.

"Machine Molding Versus Hand Molding," by Geo. Muntz.

"Pattern Shop Equipment," by A. M. Spencer. Illustrated by lantern slides.

WEDNESDAY AFTERNOON, 2 O'CLOCK.

Papers of the A. F. A.:

"The Heart of the Foundry as Seen by the Foundry Engineer," by D. S. Hawkins.

"Cores and Core Making," by F. K. Cheney.

"Continuous Melting in the Foundry of the Westinghouse Air Brake Company," by S. D. Sleeth.

"Continuous Melting," by R. H. Probert.

"The Permanent Mold," by Edgar A. Custer. Illustrated by moving pictures, showing the production of castings in permanent molds in all details.

"The Practical Value of Chemical Standards for Iron Castings," by Dr. J. J. Porter.

"Pyrometry in the Annealing Room," by S. H. Stupakoff.

Papers of the A. B. F. A.:

"General Principals of Operation of Industrial Pyrometers," by C. H. Wilson.

"Notes on Brass Melting," by Chas. T. Bragg.

"Melting of Brass Turnings in the Oil Furnace," by E. H. McVeen.

THURSDAY MORNING, 10 O'CLOCK.

Papers of the A. B. F. A.:

"Electrolytic Assay of Copper," by Geo. L. Heath.

"The Tensile Strength of Zinc-Aluminum Alloys," by W. D. Bancroft.

"System of Distributing Waste Losses in Raw Materials to the Cost of the Finished Product," by L. W. Olsen.

Papers of the A. F. A.:

"A Comprehensive Foundry Production Tally," by C. E. Knoeppel.

"Foundry Costs," by B. C. Franklin.

"Modern Cupola Practice," by J. C. Knoeppel.

"Notes on Steel Scrap in the Cupola," by C. R. McGahey.

In addition to the papers above given others have been promised to both associations. Questions will also be presented for discussion as opportunity offers at the request of members.

Among the social features of the convention are a reception tendered the visiting foundrymen and their ladies on Tuesday evening, and a river ride and barbecue Thursday afternoon and evening. The final session of each association will be for the election of officers and the transaction of business. It is possible that in each case this session will be held on the boat Thursday afternoon. If not, announcement will be made concerning it at that time.

The exhibition of the Foundry Supply and Manufacturers' Association will be a prominent feature of the Cincinnati gathering, as it has been of the last three conventions of the association. President F. N. Perkins, Arcade Mfg. Company, Freeport, Ill., and Secretary C. E. Hoyt, Lewis Institute, Chicago, have put forth every endeavor to make the Cincinnati exhibit the largest and most representative yet held. It is believed the high expectation aroused concerning it will be fully met. It will be held at Cincinnati Music Hall and will be open the entire week, May 17 to 22. The prospects are for a very large attendance of foundrymen from all parts of the country.

Important Developments in Bituminous Gas Producers.

For a number of years the Westinghouse Machine Company, East Pittsburgh, Pa., has been engaged in the development of a satisfactory form of producer suitable for gasifying the usual grades of bituminous fuels. The unusual difficulties encountered in the utilization of this kind of fuel have resulted in the trying out of many different types, both of the producer itself and of the necessary auxiliaries for producing clean gas. For the past year and a half, however, the company has been engaged in carrying out upon a commercial scale a producer plant which is now upon the market. These tests have not been conducted with a toy apparatus, but with a full sized equipment of 175 hp., including a standard gas engine of about the same power, by means of which the actual power value of the gas produced and the over-all efficiency obtainable were determined without possibility of error.

The above mentioned tests were brought to a conclusion on April 3 by drawing the fire in the producer after it had been in continuous operation on various loads and on various fuels for a year past, these 12 months having been devoted to tests of one to four weeks' duration, both 10 and 24 hr. per day on standard fuels available for power purposes. These fuels included Pittsburgh slack and run-of-mine, lignites from northern Colorado, Texas and South America, also peat and other fuels from various parts of the country. For most of the tests, the load on the equipment was maintained at full rating, although one special test of one month and a half duration was made to determine accurately the standby loss of the producer standing idle.

The drawing of this fire after one year's operation was made the occasion of a demonstration of the producer plant before Government officials and engineers from various parts of the country, specially interested in bituminous gas practice. The fire was drawn without trouble or interruption, as large clinker formations were entirely absent, although the producer had, just previous to this occasion, been running on a full load test for one month, using Pittsburgh coal. The lining of the producer was found to be practically intact and in quite good enough condition for continued operation for an unlimited period.

A detailed examination of the piping leading from the producer house to the engine on test showed that during this long period of operation there had been no deposits of tar or lampblack. As a matter of fact, this piping had not been examined for about two years and a half of producer experimentation.

The most important feature of the demonstration was the entire absence of tar formed in the producer gas. A similar examination of the mixing and inlet valves of the engine which has been used for the past year on this test showed practically no deposits of tar or lampblack, such as would interfere with the operation of the engine.

The Westinghouse plant uses no tar extractors, as no tar is made, simply a static washer of small size in the place of the usual bulky coke scrubber. A rotary exhauster draws the gas from the fuel bed and delivers it to the engine at a definite pressure.

No gas holder is used in this process, as the producer regulation is entirely automatic. The gas produced has a moderate heat value suitable for high compressions in the gas engine, and is uniform and clean, average samples showing not more than 0.02 to 0.03 grain per cubic foot impurities.

The ash is fairly clean, and analysis of samples from time to time shows that not more than 1 to 3 per cent. of the combustible in the coal escapes in the ash.

The various fuels which have been used in this producer on test have been gasified successfully, and have run as high as 34 per cent. moisture, 35 per cent. volatile, 15 per cent. ash and 1½ per cent. sulphur. The results of the tests show that with coal, such as Pittsburgh slack or run-of-mine, an overall economy of 1.1 lb. per brake horsepower hour can be secured, equivalent to a little over 9-10 lb. per indicated horsepower hour. Moreover, the producer efficiency does not vary more than 10 per cent. from full load on the plant to no load.

The results of this past year's tests have fully convinced the company that the apparatus experimented with possesses unusual commercial value, and preparations are being made for its extensive manufacture. A plant of this type has been in operation for over six months on Colorado lignite coal with equal success, as evidenced by an order recently placed with the Westinghouse Machine Company for duplicate equipment.

Customs Decisions.

Steel Gas Cylinders.

The New York Central & Hudson River, the Pennsylvania, the New York, New Haven & Hartford and other railroads have won a victory before the Board of United States General Appraisers, it being held that steel cylinders or gas holders, used for storing illuminating gas at high pressure, may be brought into this country at the rate of 35 per cent. ad valorem under the provision in the tariff act for "tubes." While Knauth, Nachod & Kuhne, bankers and customs brokers, appear as the protestants in the legal proceedings, it is known that they represent influential railroad interests. The cylinders used for storage purposes are large affairs and are kept usually at terminal stations. From the stationary cylinders gas is transferred to the smaller tubes under the passenger cars in order to replenish the supply.

According to the Government, the cylinders should be regarded as "manufactures of metal," with a tax of 45 per cent. After protracted litigation, however, the Federal courts have decided in favor of the importers. Owing to this fact, the board will now begin the determination of several hundred protests, all of which will be decided in favor of the importers. The Treasury Department will be under the necessity of making large refunds to importers, as several hundred protests are involved.

Miners' Diamonds.

The Treasury Department has served notice that it will accept the recent ruling of the United States Circuit Court of Appeals in the case of the Sullivan Machinery Company, involving the classification of so-called miners' diamonds. The merchandise consists of certain articles known indifferently as black diamonds, carbon or carbonate, and embraced generally within the term "miners' diamonds." Duty was assessed at the rate of 10 per cent. under the tariff provision for "precious stones advanced in condition." The court sustained the contention of the importers that the merchandise should be regarded as precious stones not advanced in condition. After a conference with Attorney-General Wickersham, James B. Reynolds, Assistant Secretary of the Treasury, advises that no further proceedings will be had, and refunds will be made to importers in the usual way.

The Fairbanks Company, Pittsburgh, has arranged to carry in stock a complete line of machine tools made by some of the leading manufacturers. The line will include lathes and drills of the Prentice Brothers Company, Worcester, Mass.; planers and shapers of the Mark Flather Planer Company, Nashua, N. H.; plain and universal milling machines of the Kempsmith Mfg. Company, Milwaukee, Wis., and other equally prominent makes.

Iron and Steel Production in the United States in 1908.

From advance pages of the annual statistical report of the American Iron and Steel Association are taken the figures given below, representing the production in 1908 of various steel and iron products. The statistics of pig iron, steel ingots and castings and Bessemer and open hearth rails have already been given in these columns. For comparison with the output of finished products the totals are repeated as follows, in gross tons:

	Gross tons.
Pig iron, including spiegel and ferro	15,936,018
Bessemer steel ingots and castings	6,116,755
Open hearth steel ingots and castings	7,836,729
Bessemer steel rails	1,354,236
Open hearth steel rails	567,304
All kinds of rails (71 tons iron rails)	1,921,611

Pig Iron by Grades.

The following table gives the total production of pig iron by grades from 1906 to 1908 in gross tons. The production of pig iron by States was given in *The Iron Age* of February 4, page 400:

	1906.	1907.	1908.
Bessemer and low phosphorus	13,840,518	13,231,620	7,216,976
Basic (mineral fuel)	5,018,674	5,375,219	4,010,144
Forge pig iron	597,420	683,167	457,164
Foundry and ferrosilicon	4,773,011	5,151,209	3,637,622
Malleable Bessemer	699,701	920,290	414,957
Spiegeleisen	244,980	283,430	111,376
Ferromanganese	55,520	55,918	40,642
White, mottled, direct castings, &c.	77,367	80,508	47,137
Totals	25,307,191	25,781,361	15,936,018

Crucible and Miscellaneous Steel.

In our issue of February 4, page 401, the statistics of Bessemer steel production and of Bessemer and open hearth steel rail production were given. The statistics of open hearth steel ingots and castings produced last year appeared in *The Iron Age* of March 4, page 741. The production of crucible ingots and castings in 1908 was as follows in gross tons:

	Ingots.	Castings.	Total.
Pennsylvania	35,160	1,636	36,796
Massachusetts, Connecticut, New York and other States	20,200	6,635	26,835
Totals for 1908	55,360	8,271	63,631
Totals for 1907	121,001	10,233	131,234

The production of steel in 1908 by various minor processes amounted to 6132 tons, against 14,075 tons in 1907. Apart from Bessemer and open hearth steel, the total in 1908 was thus 69,763 tons, making the total of all kinds of steel ingots, and castings 14,023,247 tons.

Production of Structural Shapes.

Our statistics of iron and steel structural shapes embrace the production of beams, beam girders, zee bars, tees, channels, angles, and other structural forms, but they do not include plates, girders made from plates, or bars for reinforcing concrete work. The total production of strictly structural shapes in 1908 was 1,083,181 tons, against 1,940,352 tons in 1907, a decrease of 857,171 tons, or over 44.1 per cent. Of the total production in 1908 about 1,080,758 tons was rolled from steel and about 2423 tons from iron, against about 1,936,379 tons rolled from steel and about 3973 tons rolled from iron in 1907. The maximum production of structural shapes was reached in 1906. The year of next largest production was 1907. The production of structural shapes in 1907 and 1908 by States was as follows:

	1907.	1908.
New York and New Jersey	181,677	86,044
Pennsylvania	1,458,507	810,146
Alabama and Ohio	47,074	31,287
Indiana, Illinois, Wisconsin, Colorado and California	253,094	155,704
Totals	1,940,352	1,083,181

Nine States made structural shapes in 1908, against

10 States in 1907. Pennsylvania made over 74.7 per cent. of the total production in 1908, against over 75.1 per cent. in 1907. Illinois, New York, Indiana, Ohio, Wisconsin and Alabama were the next largest producers in 1908. In 1908 there were 36 works which rolled structural shapes, against 37 works in 1907.

The following table gives the production of structural shapes from 1892 to 1908. Prior to 1892 structural shapes were not separated from other rolled products in these statistics:

	Gross tons.		Gross tons.
1892	453,957	1901	1,013,150
1893	387,307	1902	1,300,326
1894	360,305	1903	1,095,813
1895	517,920	1904	949,146
1896	495,571	1905	1,660,519
1897	583,790	1906	2,118,772
1898	702,197	1907	1,940,352
1899	850,376	1908	1,083,181
1900	815,161		

Production of Wire Rods.

The total production of iron and steel wire rods in 1908 amounted to 1,816,949 gross tons, against 2,017,583 tons in 1907, a decrease of 200,634 tons, or over 9.9 per cent. Of the total production in 1908 1,816,440 tons was steel rods and 509 tons iron rods. In 1907 the steel wire rods rolled amounted to 2,016,033 tons and the iron rods to 1550 tons. The maximum production of wire rods was reached in 1907. The year of next largest production was 1906. In 1908, 29 works rolled wire rods, the same number as in 1907. The following table gives the production by States since 1906:

	1906.	1907.	1908.
Massachusetts, Connecticut, Rhode Island, New York and New Jersey	236,380	233,687	200,113
Pennsylvania, Kentucky, Georgia, Alabama and Ohio	1,102,365	1,176,278	1,047,243
Indiana, Illinois and Colorado	532,869	607,618	569,593
Totals	1,871,614	2,017,583	1,816,949

In 1908 Pennsylvania rolled over 32.4 per cent. of the total for the whole country. The following table gives the production of iron and steel wire rods from 1889 to 1908 in gross tons:

	Gross tons.		Gross tons.
1889	363,851	1899	1,036,398
1890	457,099	1900	846,291
1891	536,607	1901	1,365,934
1892	627,829	1902	1,574,293
1893	537,272	1903	1,503,455
1894	673,402	1904	1,699,028
1895	791,130	1905	1,808,688
1896	623,986	1906	1,871,614
1897	970,736	1907	2,017,583
1898	1,071,683	1908	1,816,949

Trade Brightening in Canada.

TORONTO, April 24, 1909.—Improvement continues in the trade of Canada. The ebb from the high point of prosperity was probably not so great here as in the United States, and the return tide seems to have set in earlier and to have crept on faster. The unemployed have not all got back into the ranks of active producers, but the great majority of them have. Immigration has become active once more, and the newcomers are finding work.

Important Construction Projects Going Ahead Again.

Many large projects of construction that were checked by the money pinch experienced from the middle of 1907 onward are to be undertaken this year. Railroad building, that had been arrested all over Canada, is being entered upon with confidence again. The Algoma Central and Manitoulin & North Shore lines, which belong to the Lake Superior Corporation, are to be pushed to completion in Ontario. The gap in the Canadian Northern system between Port Arthur and Sudbury is to be closed, the Ontario Legislature having just granted a large land subsidy to the company to aid in the construction of the line. In the West all three transcontinental systems will spend liberally on new lines. Hydro-electric power development is to be carried on extensively in many parts of the country; hundreds of miles of transmission lines are to be built; substations are to be erected and equipped; municipal distribution systems are to be established, and electric motors are to replace independent power plants in many factories. General building operations are beginning the season very promisingly. In every important city the permits issued show a great increase over those of a year ago. Brick and other building material are advancing sharply in price in response to the expanding demand on house construction account.

The great change in the money market has been stimulating to the carrying out of public improvements by municipalities. Canadian municipal bonds have been in good demand, and scores of millions of dollars are being expended by towns and cities on the construction of new public works and the bettering of old ones. In the last twelvemonth about $200,000,000 has been brought into the country from the sale of bonds, debentures and shares in the British money market. The spending of this capital is affording employment to wage earners who might otherwise have yet been standing idle.

Agricultural Prosperity Saved the Country.

Canada's last crop, though not up to the high expectations formed of it a month before the harvest, was a security against the extreme of depression. A money pinch could not altogether paralyze trade, or long keep it dull, when the farmers were well off. A large agricultural output, marketable at high prices, was bound to save the situation, notwithstanding that much of the proceeds had to go to liquidate debt. It turned out that, though the bills to be paid were large, the farmers had enough money in their own control to maintain trade in a fair state of activity. At the present time, when May wheat is selling at between $1.20 and $1.30 a bushel, and when even next crop of wheat is being quoted at very high prices, farmers are sowing more wheat than they ever put in in any former seeding.

It is estimated that the number of immigrants entering the prairie provinces of Canada from the agricultural States to the south this spring will be not less than 70,000. These additions to the productive population of that part of the country are said to be of the highest economic quality, the heads of the families being generally men of considerable substance and of the right kind of experience to do well on Canadian lands.

United States Tariff Revision Has Its Influence.

Another factor that has been perceptible in the improving of trade in Canada is the progress of tariff revision in the United States. Canadian manufacturers remember the last revision. It was a slow process. They remember also the revision of which the Wilson act was the result. For Canadian trade that downward changing of the duties was worse while it was in progress than the later upward one of 1897. It was attended by an almost panicky selling of American goods in Canada. There had been some reason to think that the present revision might be downward, and that the first effects upon Canadian trade would be like those produced by the making of a Wilson bill. It is now felt that the revision is not to be a very disturbing one, and, hence, that it will not cause any rush on the part of United States manufacturers to get rid of their goods for whatever money can be obtained for them.

At the same time, the brisker trade in Canada is shown in the buying of American goods, as well as in the buying of Canadian goods. In the fiscal year closing the 31st of last month the revenue from duties on imports amounted to about $12,000,000 less than it did in the year before. But the last month or two have shown a marked increase in customs receipts, indicating that the import business is reviving. There is no doubt that conditions were favorable for a revival. In the first place, Canadian farmers have money to spend, and have a very hopeful outlook before them. They are, therefore, buying and ordering less reservedly than they were. In the second place, Canadian manufacturers have in many cases no surplus stocks with which to meet a more animated demand. Their output had been sharply restricted by the banks, who believed that many of their customers had extended too rapidly. Thus room was left for some expansion of the import trade at this season. It is understood that with the opening of navigation large shipments of merchandise from United States ports will go forward to Fort William and Port Arthur. Fence wire and general hardware are expected to figure quite largely in these shipments. C. A. C. J.

Trade Publications.

Boring and Turning Mills.—Gisholt Machine Company, Madison, Wis. Page for loose leaf binder. Shows a 42-in. vertical boring and turning mill finishing locomotive piston rings, and attention is called to the efficiency of the machine for this class of work. A 36-in. boring mill is also shown finishing a locomotive eccentric.

Mining Wearing Parts and Smelter Castings.—Midvale Steel Company, Philadelphia, Pa. Catalogue, series 26. Particularly a catalogue of wearing parts of mining mchinery, but also mentions some of the company's other products. Stamp mill parts, roll shells, Chilean mill spares and crusher spares are shown and brief mention is made of cast steel slag pots, cast steel matte ladles, ingot molds, &c. A number of miscellaneous steel castings shown illustrate the wide variety the company makes. Locomotive tires and rolled steel pressed car wheels are referred to and views are given of some of the company's large products, including forged steel shafts and crankshafts, guns and armor plates.

Hydraulic Jacks.—The Duff Mfg. Company, Pittsburgh, Pa. Catalogue, 6 x 9 in., 15 pages. Devoted to the Duff-Bethlehem forged steel hydraulic jacks, which were described in *The Iron Age*, March 11, 1909. A feature of this jack is that the cylinder and its bottom are forged in one piece, which obviates the necessity of packing. The ram bottom of the machine is also integrally formed with the pump socket. Wrecking jacks, journal box jacks and jacks with traversing bases are shown, in addition to standard types.

Tubular Products.—National Tube Company, Pittsburgh, Pa. Folder. Indicates the variety and type of products made by the company. These include pipe of all kinds, fittings, valves, &c., and Shelby seamless tube products.

Well Drilling and Pumping Machinery.—American Well Works, Aurora, Ill. Folder. Shows some of the latest types of well drilling and pumping machines, including a turbine centrifugal well pump, an air lift for pumping deep wells, a coring machine, a standard drilling machine and air compressor and a vertical compound steam engine.

Electric Time Systems.—Industrial Instrument Company, Foxboro, Mass. Bulletin No. 22. Time systems especially adaptable for industrial plants are illustrated in a number of types. An interesting machine is a programme clock, which signals automatically.

Tube or Pipe Cutters.—Fox Machine Company, Grand Rapids, Mich. Catalogue No. 92, 6 x 9 in., 12 pages. In addition to the company's standard line of tube cutters the book shows a number of heavy tube cutters arranged with motor drive, which are adaptable for cutting off boiler flues and for use in tube mills and warehouses. Several types of hand power cutters are shown, the smallest a machine for very light work, which cuts from ⅜ to 1 in. tubing. On the last page are illustrated a hand miller, a hand and power feed miller, polishing machine and a sensitive drill.

Cupola Flux.—Basic Chemical Company, Evansville, Ind. Leaflet describing results from the use of Keystone thermal flux in the iron foundry cupola. The claims include saving of cupola lining, dropping of bottom clean, increased percentage of scrap possible, fluid iron, reduced amount of slag, saving in melting time and lessened amount of spoiled castings.

Armour Institute of Technology.—Bulletin outlining the work for the summer session, which includes the period from June 21 to July 30, 1909. Copies of the bulletin may be had by addressing the Dean of Engineering Studies, Armour Institute of Technology, Chicago.

Structural Steel Shapes, Plates, Bars, &c.—Bulletin of material on hand April 17 and ready for immediate shipment from the storehouses at the North Works of the Illinois Steel Company, W. H. Pratt, manager, Chicago. Sizes and quantities are given.

Free Ore and the Eastern Pig Iron Association.—At the meeting of the Eastern Pig Iron Association, held in Philadelphia last week, Charles M. Schwab, president of the Bethlehem Steel Company, so forcibly presented his arguments in favor of free iron ore that the majority voted in favor of advocating, at Washington, that iron ore be placed on the free list. During the course of the same meeting E. C. Felton, president of the Pennsylvania Steel Company, spoke on the same lines. Some of the members of the association have since the meeting visited Washington to argue for free ore. Others, however, are understood to have made it clear that they had not changed their position.

The Warren Iron & Steel Company, Warren, Ohio, has been incorporated with a capitalization of $100,000 to operate the plant of the Penn Shovel Mfg. Company, which was recently purchased from the receivers by D. L. Helman and C. B. Loveless. The company announces that it expects to place the rolling mill department for the manufacture of sheet steel in operation in about 30 days. The incorporators of the new company are D. L. Helman, C. B. Loveless, D. A. Geiger, L. L. Jones and Charles Fillius.

United States Steel Corporation's Earnings.

The statement of the United States Steel Corporation's earnings for the quarter ending March 31, 1909, makes the following showing, as compared with the corresponding period of 1908:

	1909.	1908.
January	$7,262,605	$5,052,743
February	7,669,336	5,709,428
March	7,989,327	7,466,834
Total after deducting all expenses incident to operations, including those for ordinary repairs and maintenance of plants, and interest on bonds and fixed charges of the subsidiary companies	$22,921,268	$18,229,005
Less charges and appropriations for the following purposes:		
Sinking funds on bonds of subsidiary companies	$272,533	$291,518
Depreciation and reserve funds	3,463,666	1,771,227
	$3,736,199	$2,062,745
Net earnings	$19,185,069	$16,166,260
Deduct interest for the quarter on U. S. Steel Corporation bonds outstanding	$5,939,208	$6,000,987
Sinking funds for the quarter on U. S. Steel Corporation bonds:		
Installments	1,012,500	1,012,500
Interest on bonds in sinking funds	360,255	298,476
	$7,311,963	$7,311,963
Balance	$11,873,106	$8,854,297
Dividends for the quarter:		
Preferred, 1¾ per cent.	$6,304,919	$6,304,919
Common, ½ per cent.	2,541,513	2,541,513
Surplus for the quarter	$3,026,674	$7,865
	Tons.	Tons.
Unfilled orders on hand, March 31	3,542,595	3,765,343

The earnings for the quarter ending December 31, 1908, were $26,246,674.90. The unfilled orders on hand at the close of that quarter aggregated 3,603,527 tons.

The Administrative Council of the National Metal Trades Association has decided to move its executive offices from Cincinnati to Cleveland, Ohio, where in the future Robert Wuest, commissioner of the association, will make his headquarters. Offices have been engaged in the New England Building, Cleveland, and Commissioner Wuest's office force and effects will leave Cincinnati on Friday of this week. The removal has been talked of for some time and was brought about with a view to closer connection by mail with certain parts of the country, particularly in the interests of the New York and New England members. The New England Building is also the headquarters of the Cleveland branch of the association.

The Wickwire Steel Company, Buffalo, N. Y., has contracted with F. H. Kindl, 413 Bakewell Building, Pittsburgh, for the use of the Menne oxygen melting process at its blast furnace plant. The Stewart Iron Company, Sharon, Pa., is also about to put the Menne equipment in use, and negotiations with a number of furnace companies are under way. This method of opening frozen tap holes and tuyeres was illustrated in *The Iron Age* of January 21, 1909, page 222.

It is announced that the plan of reorganization of the South Baltimore Steel Car & Foundry Company, Baltimore, Md., made public in January, has become effective. The plan provides for the issuance of new stock amounting to $1,500,000, of which $1,250,000 is to be given in settlement of the claims of the creditors.

Legal Decisions on Business Questions.

BY A. I. H. STREET.

Licenses for Peddlers of Stoves, Etc.—The Oregon statute requiring peddlers of stoves, &c., to procure a license is unconstitutional, as arbitrary and class legislation and a denial of equal protection of the laws, in that by failing to enumerate peddlers of clocks, patent medicines, &c., it indirectly permits them to do business without paying a license fee while a large fee is imposed on the first mentionad class. (Oregon Supreme Court, State *vs.* Wright, 100 Pac. Rep. 296.)

Corporations—Bankruptcy—Acts of Directors.—The directors of a manufacturing corporation, at a meeting regularly called and held and attended by a quorum, adopted a resolution admitting the corporation's insolvency and reciting a willingness that it be declared bankrupt. Held that, in the absence of fraud or collusion by the creditors, the resolution authorized them to institute proceedings in bankruptcy, and justified an adjudication of bankruptcy, notwithstanding the fact that a director residing in another State was not given notice of the meeting, especially in view of the fact that the stockholders and the directors' successors have made no attempt to set aside the appointment of a receiver obtained by the creditors. (U. S. District Court, Western District, New York, *in re* Lisk Mfg. Company, 167 Fed. Rep. 411.)

Trademarks and Trade Names—Infringement.—Since 1880 plaintiff and its predecessor have manufactured various styles of steam boiler injectors. In general construction these appliances were based on an injector which had been manufactured under a patent which had expired. From time to time plaintiff and its predecessors obtained letters patent respecting some particular part of various styles of injectors, none of which patents, however, were fundamental, and some of which after trial were abandoned. One style of nonlifting injector, known as class C, was never protected by any patent in any part, and another style never employed any of the patents appearing in the record. From the beginning of manufacture plantiff and its predecessors adopted the word Monitor, and applied that word to all the various styles of injectors put on the market. The word Monitor had not been theretofore used by any manufacturer of boiler injectors, and plaintiff's output became known to the public and was sold as Monitor injectors, which word was cast upon them all. After all of plaintiff's patents had expired, an Ohio corporation, for which defendant was sales agent, began the manufacture and sale to the trade of an exact reproduction of certain styles of plaintiff's injectors, and cast on them, in exact imitation, the word Monitor, and issued a catalogue respecting styles, taken bodily from the catalogue issued by plaintiff. The injectors manufactured by the Ohio company were not only painted like those of plaintiff but were numbered in the same way. There was placed, however, on those manufactured by it a plate containing its name and address. Held that plaintiff is entitled to restrain use of the word Monitor as applied to injectors, both because it has acquired the right to use it as a trade name and because the infringement tends to deceive the public. (New York Supreme Court, Appellate Division, Nathan Mfg. Company *vs.* H. A. Roger Company, 114 N. Y. Supp. 1033.)

Employees—Assumption of Risks.—An employee of mature age whose employment required him in going to and from his work to pass at an elevation of 25 ft. over a gang plank 10 ft. long, 12 in. wide and 2 in. thick, supported at one end by a steel frame and at the other by a concrete abutment, and who continued in the employment 10 days without complaint, passing over the plank several times a day and having full opportunity to see that the plank was not fastened, assumed the risk of injury through falling therefrom, since he had as full knowledge of the dangerous condition as did the employer. (Kansas Supreme Court, Riverside Iron Works *vs.* Green, 100 Pac. Rep. 482.)

Employees—Injury—Proximate Cause.—The proximate cause of injury to a foundry molder's helper whose duty it was to operate, by means of a crank, a crane used in lifting molten metal to the molds, caused by his hand being caught by unguarded cog wheels on slipping from the crank handle, was the slipping of the hand and not the employer's failure to guard the cog wheels as required by statute, and hence the employer is not liable for the injury. (Indiana Supreme Court, Crawford & McCrimmon Company *vs.* Gose, 87 N. E. Rep. 711.

Employees.—An employee in a tin plate mill injured while assisting other workmen in putting in place a large iron roller, through negligence of a master mechanic assisting in the work, cannot recover from the employer, since he and the master mechanic were fellow servants. An employer is liable for the negligent performance by one employee of the employer's duty to another employee resulting in injury to the latter, but where the negligent employee's act is in the line of the ordinary workman's duty the employer is not liable, though the negligent employee was a vice principal in charge of the work. (Pennsylvania Supreme Court, King *vs.* McClure Company, 72 Atl. Rep. 228.

Rights of Patentee.—A patentee who during the pendency of his suit for an infringement makes application for and obtains a reissue of the patent on the theory that the original specification is insufficient estops himself to thereafter assert that the specification was sufficient or to prosecute the infringement suit further. (U. S. Circuit Court of Appeals, Coffield *vs.* Fletcher Mfg. Company, 167 Fed. Rep. 321.

Rights of Patentee.—Where one contracting with an owner of patents to manufacture and sell a patented article, under an agreement to pay royalties at a fixed rate and to furnish statements of all sales, makes false reports of sales and fails to pay the royalties as they mature; the owner sues for an accounting; thereafter the other party sells the article under another name, advertising it by the circulars previously used, the court, in addition to awarding recovery of the royalties due, can terminate the agreement and cancel the right to use the patent. (New York Court of Appeals, Russell Hardware & Implement Company *vs.* Utica Drop Forge & Tool Company, 87 N. E. Rep. 788.)

Contract to Construct Machine—Rights of Seller.—Where the contract for the construction of a machine provides for the payment of the balance of the purchase price on delivery of the machine and no delivery has been tendered, on suit by the buyer to recover the advance payment the seller has no basis for a counterclaim. (New York Supreme Court, Appellate Division, Vollmer *vs.* Hayes Machine Company, 114 N. Y. Supp. 446.)

Conditional Sales—Form.—Title to boilers sold was reserved to the seller until payment of the price where the contract of sale referred to the specifications as a part of the contract and they provided for such reservation. (United States Circuit Court, Western District New York, Garrett-Cromwell Engineering Company *vs.* New York State Steel Company, 167 Fed. Rep. 143.)

Sales—Building Contracts.—Where an agreement to supply structural steel for a building requires certification by the architects of the contractor's delay in furnishing the material, such certification is a condition precedent to a recovery of damages for a delay, whether recovery be sought by suit for that purpose or by cross bill in the contractor's action for the contract price of steel furnished. (Virginia Supreme Court of Appeals, Belmont Iron Works *vs.* Hotel Corporation of Norfolk, 63 S. E. Rep. 1068.)

Youngstown Sheet & Tube Company Extensions.—The Youngstown Sheet & Tube Company, Youngstown, Ohio, is now putting in two butt weld mills for making the smaller sizes of pipe and one lap weld mill for making 20-in. pipe and smaller. These additional mills will cost about $1,000,000, and will increase the company's pipe making capacity to about 25,000 tons per month. With the completion of the new mills the company will have 10 pipe mills, making it the second largest manufacturer of pipe in the country.

The production of pig iron in Germany in February was 949,667 metric tons, against 1,021,721 tons in January. In February, 1908, it was 994,186 tons. The depression has reduced the output of pig iron much less than the reports of conditions in finished lines would indicate, and this with due allowance for the operation of plants at which electric power for lighting or for steel works or coke ovens is dependent upon engines driven by blast furnace gas.

The T. R. Almond Mfg. Company, Ashburnham, Mass., is advising the trade that it has been successful in defending itself from the suit brought against it by the Jacobs Mfg. Company for the infringement of a patent. The decision was rendered March 27 in the United States Circuit Court for the Eastern District of New York. The Almond Company manufactures drill chucks, right angle countershafts, quarter turn couplings, turret head tools and other specialties.

The Dunbar Furnace Company, Dunbar, Pa., has reduced the wages of its blast furnacemen 15 cents per day and common labor 10 cents per day. The wages of all employees paid by the month have been reduced 7½ per cent.

For the first time since October, 1907, all the 11 open hearth furnaces of the Lackawanna Steel Company, Buffalo, N. Y., are now in operation.

NEWS OF THE WORKS.

Iron and Steel.

The receivers of the Duncannon Iron Company, Duncannon, Pa., offered the plant at public auction April 22. There was only one bid of $58,000, which was not accepted, as the lowest price allowed by the court was $63,000, subject to a mortgage of $37,000. The sale was declared off.

At a public offering of the plant of the Passaic Steel Company, Paterson, N. J., April 17, no bid was received for the plant. The lowest price that would be accepted was $700,000, but no one was present who would bid that amount.

The Crum-Lynne Iron Company's plant at Leiperville, Pa., which has been idle for some time, is being thoroughly overhauled in preparation for being started up again.

The Thomas Steel Company, Niles, Ohio, is putting in five additional sheet mills, doubling the capacity of its present plant. The company will install complete additional equipment, including engine, boilers, crane, &c.

The Maryland Steel Company, Sparrow's Point, Md., has plans in course of preparation for the installation of an open hearth plant, but has not yet decided when construction work will be started. About 750 men have resumed work in the steel rail and Bessemer departments, the orders now in hand being sufficient to keep the plant in operation for 10 days, but the management hopes that before these are finished a sufficient number of orders will be secured to keep the plant in operation.

The Forter-Miller Engineering Company, Hartje Building, Pittsburgh, Pa., has received a contract for building a gas producer plant at the Etna Iron & Tube Works of Spang, Chalfant & Co., Inc., Etna, Pa.

The report that A. M. Byers & Co., Inc., Pittsburgh, will build a new skelp mill, 35 more puddling furnaces and a pipe mill at Girard, Ohio, is absolutely without foundation.

General Machinery.

The N. C. Davison Company, Keenan Building, Pittsburgh, reports considerable activity in the line of refrigerating machinery. Recent contracts include the following: D. J. Johnston, Uniontown, Pa., one 6-ton Larsen & Baker ice machine and a 16-hp. Jacobson gas engine; Skinner & Co., Conneaut, Ohio, one 2½-ton ice machine and 6-hp. gas engine; Hiland Dairy Company, East End, Pittsburgh, one 5-ton machine and 10-hp. motor; W. H. Doll, Bellefonte, Pa., one 4-ton machine; Hettenbaugh & Denniston, Grove City, Pa., one 1½-ton machine and 5-hp. Bessemer gas engine; A. J. S. Campbell, Petrolia, Pa., one 2-ton ice machine and 6-hp. Jacobson gas engine; R. H. & D. L. Lewis, Warren, Pa., one 2½-ton machine.

The city of Monroe, N. C., requires two electrically driven pumps for raising water from deep wells.

Plans are being prepared and contract will be let in a few days for a two-story brick factory building, 50 x 135 ft., to be erected and occupied by the Weinman Pump Mfg. Company, successor to the Weinman Machine Works, Columbus, Ohio. Considerable new machinery will be required for the equipment of the new building, a portion of which has already been purchased.

The Bernard Gloekler Company, Pittsburgh, was recently awarded contracts for mechanical refrigerating and insulation systems for installation in the State Institute for Feeble Minded at Polk, Pa., and the State Hospital for the Insane at Warren, Pa., which aggregate $30,000. The company reports considerable activity in this line just now and that the business outlook is encouraging.

The recent fire at the plant of the Fishkill Landing Machine Company, Fishkill-on-Hudson, N. Y., destroyed only the main pattern storehouse, none of the shops being injured. The company will be inconvenienced for a time by the loss of the patterns, but will have new patterns made as quickly as possible.

The Crowley Iron & Machinery Company, Crowley, La., has acquired the plant and business of the Champion Iron Works and will handle a full line of pumping machinery, rubber goods, steam and gasoline engines, steam boilers, air compressors and general machinery supplies. The officers are S. D. Wilder, president; J. P. Burgin, vice-president; C. E. Warren, secretary and treasurer.

The recent fire at the shops at Elkins, W. Va., of the Western Maryland Railroad only damaged the roof of one of the buildings, shafting, pulleys and belting. It will not be necessary to purchase any new machinery.

The Missouri, Tennessee & Georgia Railroad, Humboldt, Tenn., has under consideration the erection of a new repair shop, but no definite plans have as yet been formulated. I. H. Dungan is president.

Dodge & Day, engineers, Philadelphia, Pa., have recently been commissioned by the Emerson Steam Pump Company, Alexandria, Va., to make a preliminary report and prepare plans for a new plant to be erected just outside of Alexandria.

The Luitweiler Pumping Engine Company, Los Angeles, Cal., has secured the plant of the American Laundry Machinery Company at Lincoln Park, Rochester, N. Y. President F. W. Luitweiler has returned to Los Angeles to take charge of the dismantling of that factory and the removal of the machinery and patterns to Rochester. The company, which is composed largely of Rochester capital, is to manufacture, as it has in the past, pumps for deep wells and high pressures. To this will be added automobile fire engines, the feature of which will be the use of the same motor to operate the pump that is used to drive the vehicle.

The Peck Air Compressor Company, Rochester, N. Y., has been incorporated by Lloyd L. Sykes, Frank Peck, James Williams and Wesley P. Sheets.

The C. N. Cady Company has been incorporated at Canastota, N. Y., with a capital stock of $50,000, to manufacture motors, engines and machinery. Chas. N. Brady is president.

Foundries.

The Quincy Casting Company, Quincy, Ill., is erecting a new foundry for the manufacture of light and heavy gray iron castings, which will be ready for service about the middle of May.

The Monarch Foundry Company, Detroit, Mich., has increased its capital stock from $15,000 to $25,000.

The Malleable Iron Range Company, Beaver Dam, Wis., has decided to put up a two-story brick factory, 60 x 170 ft., of mill construction, and an L-shaped foundry, 70 x 210 x 270 ft., with steel frame.

The Mensching Brass Foundry Company, Milwaukee, is having plans drawn for an addition to its plant.

Announcement is made that the plant of the Central Foundry Company at Anniston, Ala., which has just been rebuilt after having been destroyed by fire, will be ready for operation May 3.

Power Plant Equipment.

The Prescott (Wis.) Light & Power Company will build a substation, installing a rotary converter, transformers, &c.

A producer gas engine, electric generator, pump, &c., will be installed in a new power plant near Hibbing, Minn., which is to be erected by the Power Equipment Company, Minneapolis, for A. P. Silliman.

The Bannock Engineering Company, Pocatello, Idaho, is designing an entirely new power station, to be constructed by the Bear Lake Power Company, operating in that vicinity. It is understood that this will be situated some distance from the company's present plant and probably used independently of the latter.

The Oelwein (Iowa) Light, Heat & Power Company is reported to be in need of additional steam and electric generating equipment. Extensions to the power plant may be entered upon this summer.

The City Council of Plankinton, S. D., will receive bids until May 10 for the construction and equipment of a complete water works system.

The city secretary of Greenville, Texas, will receive bids until May 11 for a compound, condensing crank and flywheel pumping engine, brass tube surface condenser, with air pump and other accessories.

Dodge & Day, engineers, Philadelphia, Pa., have recently installed gas producers and regenerative gas furnaces of their own design in the plants of the Bradlee Chain Works and Fayette R. Plumb, Inc., in Philadelphia. In both of these installations the boilers as well as the furnaces are fired by gas from the producer.

Bridges and Buildings.

The Wm. B. Scaife & Sons Company, Pittsburgh, Pa., has been awarded contract for the structural steel work in the new building of the Driggs-Seabury Ordnance Corporation at Sharon, Pa.

The Vulcan Iron & Steel Works, Hackendahl & Schmidt and A. F. Wagner, Milwaukee, Wis., have recently received orders for large quantities of iron and steel to be used in local building, indicating greater activity than has been known for more than two years past.

The Lackawanna Bridge Company has been incorporated at Buffalo with a paid-up capital of $500,000, and will build a plant in the vicinity of the Lackawanna Steel Company's Works, for the fabrication of bridges and structural steel work. The directors are Beverly L. Worden of the Worden & Allen Company, Milwaukee, who will be president; Fordyce H. Bottom, Frank R. Bacon and Jacob E. Friend of Milwaukee, and Ralph A. Kellogg of Buffalo.

The Armond Concrete Bridge Company, Albany, N. Y., has been incorporated with a capital of $15,000 by Edward J. Doyle, Hugo J. Schuermann and Harry M. Peck, all of Albany. The company has already opened offices at 100 State street, and will engage in a general engineering and contracting business, catering largely to reinforced concrete construction. The incorporators of the company were formerly connected with the office of the State Engineer.

The Milwaukee Bridge Company has taken contract for the structural iron and steel to be used in the 120 x 200 ft. addition to the United States Glue Company's works at Carrollville, Wis.

Hardware.

The growth of demand for its products has led the Marshalltown Trowel Company, Marshalltown, Iowa, to arrange for the enlargement of its plant. Two brick buildings, one 60 x 150 ft., comprising the main factory, and another 50 x 60 ft., to be used as a machine shop, are now under construction. Further improvements contemplated consist of extensions to be made to the present buildings. It is expected that the new quarters will be completed about June 1.

W. C. Shinn, Lincoln, Neb., manufacturer of copper cable lighting rods, has just completed and is now occupying a new two-story and basement factory, 50 x 70 ft., of brick and concrete construction.

The Dilver Mfg. Company, Minneapolis, Minn., is erecting a one-story brick and iron factory building, 60 x 175 ft., which will be equipped with machinery for the manufacture of stamped steelware and tools. The building, which is now approaching completion, will also be fitted with a modern tinning plant. The principal line now made includes the McCoy improved colander and cutting spoons, to which other specialties will be added. The plant will probably be ready to begin operations by July next, and the orders in hand are sufficient to insure active work for some time ahead.

A new company, styled the Ideal Stove & Range Works, Belleville, Ill., has been organized, with a capital stock of $5000, the officers of the company being as follows: Henry Schweinfurth, president; Adolph Noser, vice-president, and Joseph L. Herman, secretary and treasurer.

The New Haven Machine Screw Company, New Haven, Conn., has enlarged its power plant by the installation of a new Bigelow boiler. The company manufactures hexagon, fillister or round head cap screws, collar and shoulder screws, as well as all kinds of special screws.

The Eastman Kodak Company, Rochester, N. Y., will add to its manufacturing plant a brick, steel and reinforced concrete factory building, 322 x 355 ft., one and two stories and basement, for the manufacture of photographic dry plates.

Miscellaneous.

The Aldrich Paper Company, Gouverneur, N. Y., will soon commence construction on a large steel flume at its talc mill at Emeryville. The flume will be 150 ft. long, 24 ft. deep and 30 ft. wide. The company also has under consideration the erection of an electric generating plant and a transmission line to Natural Dam, where the surplus electricity may be used in connection with the paper mill operated by the company at that point.

The MacKinnon Mfg. Company, Grand Rapids, Wis., has made arrangement to manufacture the Symons Steel King dump wagon, using its own patent wheel.

The S. H. Roberts Boiler & Tank Company, Pittsburgh, with a plant at Mars, Pa., has applied for a Pennsylvania charter, with a capital stock of $25,000. The company proposes to erect an additional building and will require some new equipment. It builds car tanks, boilers, self-supporting stacks, large tanks for oil storage, steel plate works, &c., and the addition will increase its capacity.

Upon application of the Trust Company of America, trustee for the bondholders, J. C. Rogers has been appointed receiver for the Lanyon Zinc Company, one of the largest smelters in the country, with headquarters at Iola, Kan. It is understood that the action of the trust company in having the receiver appointed was taken with a view to an early reorganization of the company. There will be no interruption of the operations of the company.

The Minneapolis Bedding Company, Minneapolis, Minn., is to enlarge its plant for the manufacture of iron beds by the erection of several new buildings on ground recently purchased, the group when completed to cover 15 acres of ground and represent an investment of about $300,000. All the buildings will not be erected at once, the intention being to gradually add to the plant. The first building to be erected, on which work is expected to start within the next few weeks, will be 175 x 185 ft., five stories, of reinforced concrete construction, conforming in general appearance to the present buildings. The building will cost about $100,000. To provide for the greater capacity the company has increased its capital stock from $150,000 to $300,000.

The Adjustable Steel Centering Company, Fond du Lac, Wis., will remove to a larger plant and install new machinery to take care of a rapidly growing business.

The Scandia Brick & Tile Company, Scandia, Iowa, will put up a new building and add largely to its equipment of machinery.

The Gordon Automatic Steel End Gate Company, Gordon, Neb., will build shops in Omaha.

The Capell Fan & Engineering Company, Monongahela, Pa., whose plant was recently destroyed by fire, has purchased the plant of the Black Diamond Engineering Company, which it will improve for its purposes, rebuilding some parts of the shop. The plant will be enlarged as trade improves.

The American Metal Door Company, Jamestown, N. Y., manufacturer of fireproof metal doors and metal furniture, has outgrown its present facilities and is planning to erect an extensive new plant. It has not been definitely determined whether the new plant will be erected in Jamestown or some other city. Negotiations are under way covering sites in two or three different cities, and as soon as the location is definitely decided on plans covering the construction of a new plant will be prepared.

The Acme Pattern Company has been incorporated at Buffalo, N. Y., with a capital stock of $20,000, by Adam Shabtac, Lillian E. Shabtac and Emil H. Bergens.

The Rochester Brass Bed Company, Rochester, N. Y., has been organized, with a capital stock of $40,000, to manufacture brass beds. The directors are William F. Enders, M. J. Isselhardt, Albert Ploch, Leon Goldsmith, Fred Pfeffer, William J. Maloney and Arie Roodenberg.

The Cutler Mail-Chute Company, New York, has been incorporated, with a capital stock of $2,000,000. The purpose of the organization is to engage in the manufacture and sale of brass, bronze, wrought iron and sheet iron mail chutes and boxes. The directors of the company are Edmund C. Converse, Ellis P. Earl and Thomas W. Lamont, all of New York. The Cutler mail chute is now being manufactured at 17 Elm street, Rochester, N. Y., by the Cutler Mfg. Company.

The American Radiator Company will construct a large office building and laboratory for thermal research, adjoining its Pierce plant at Elmwood avenue and the New York Central Railroad Belt Line, Buffalo, N. Y. The building will be two stories, of enameled brick and granite, and will cost $100,000, with laboratory equipment.

The George N. Peirce Company, Buffalo, N. Y., manufacturer of automobiles, will add to its plant at Elmwood avenue and the New York Central Railroad Belt Line, two reinforced concrete factory buildings, one 80 x 100 ft., three stories, and one, 55 x 100 ft., two stories, to cost $50,000. Considerable new machinery equipment will be required.

The factory and other property of the National Adjustable Chair Company at Greenfield, Ind., has been purchased by a newly organized company, the president of which is James Webb of Maxwell, Ind., and secretary, George W. Gordon of Greenfield. The factory, which had been idle, has been put in operation again.

The Industrial Club of Alexandria, Ind., has closed a contract with the Alexandria Metallic Bed Company to establish a plant on the site abandoned by the Kelly Ax Mfg. Company. The plant will be owned by Cleveland, Ohio, jobbing houses. The company receives a free site and a bonus of $10,000, conditioned on the fulfillment of the contract.

The Oakland City Light, Heat & Fuel Company has been organized at Oakland City, Ind., to build and operate a natural gas system, natural gas in large supply having been discovered in that part of Gibson County. Walter McLaughlin is at the head of the company.

A third story will be added to the main building of the plant of the Maxwell-Briscoe Motor Company at Newcastle, Ind. This building is 60 ft. wide and extends three blocks. An addition will also be built, 150 x 360 ft. The company's payroll at this plant is now $22,000 weekly.

Frederick A. Waldron, New York, has let for the Neidich Process Company, Burlington, N. J., the contract for its new three story reinforced concrete factory building.

The Wheeling Stamping Company, Wheeling, W. Va., has let contracts for machinery and a lithographing outfit, which it will require for the manufacture of small square and round tin boxes, such as are used in the druggist trade. Collapsible tubes will also be manufactured. The new department will be put in operation in the latter part of May.

The Architectural Iron & Wire Works, Wheeling, W. Va., which is making improvements to its plant to cost about $6000, is in the market for a 35 or 40 hp. gas engine.

The Keystone Furnace Construction Company, Fulton Building, Pittsburgh, has received a second order from the Inland Steel Company, Indiana Harbor, Ind., for door frames for two open hearth furnaces.

The Matthews Gravity Carrier Company, St. Paul, Minn., is placing its apparatus in a large number of industrial plants and an addition to the company's works may be necessitated before the summer is over.

The Anderson Motor Company, Anderson, Ind., recently organized, has purchased the motor and accessory business of the Westerfield Motor Company and will continue the manufacture of Westerfield motors and transmission in a new brick plant which it is building and in which it expects to move in about 30 days. E. F. Dice, secretary and general manager of the new company, has been superintendent and designer for the Westerfield Motor Company for the past three years. T. C. Werbe is president and treasurer and U. G. Dodson vice-president.

The Triple Motor Truck Company, Owosso, Mich., has been incorporated, with a capital stock of $340,000. The company is headed by F. O. Paige, formerly of the Reliance Motor Company.

The Iron and Metal Trades

General Activity and Firmer Markets in Pig Iron.

A Cessation of Cutting in Bars, Shapes and Plates.

With the exception of the Chicago and Pittsburgh districts the leading distributing markets have shown a good deal of activity in pig iron. Large quantities of iron have been taken by the harvester interests and further purchases are pending. Malleable makers are negotiating for additional quantities in New England, and founders in that territory have made some liberal purchases. Some of the leading interests in the Buffalo District, having booked very liberal orders on the basis of $14.50, Buffalo, are now withdrawing from the market. Large sales have been made by Cleveland furnacemen, and stove makers, radiator manufacturers and pipe foundries in the Central West have been and are still in the market. In eastern Pennsylvania one lot of 6000 tons of basic pig was placed, and negotiations are pending for additional tonnage. Some round lots of basic pig have also been placed in the St. Louis District.

With very few exceptions, Southern makers are asking $11.50 for No. 2 foundry, and buyers have, therefore, been turning to the furnaces of the Central West and the East. The feeling is becoming more general that the tide has turned, and that for the near future higher rather than lower prices are likely. It seems that a good share of the requirements still remain to be covered, but, on the other hand, the stocks, chiefly in the Central West, are liberal in quantity. The furnaces have been finding it expedient to convert the ores for which they were forced to pay into pig iron on which they could borrow money.

Indiscriminate cutting on bars, shapes and plates is no longer to characterize the operations of some of the leading interests, and it looks as though this lead will be rather joyfully followed by others. It is a fact, however, that the tonnage has not expanded in the extraordinary manner which some reports would seem to indicate.

Some very low prices have been made in fabricated structural work, both for domestic markets and for export. Among the latter contracts there should be noted about 5000 tons of bridge work for the Cuba Railroad and 2500 tons for the Madeira & Mamore road. The Erie bridge requirement for the year, which will aggregate about 5000 to 6000 tons, is to be divided among three interests. There is a good deal of activity in moderate lots of structural material for buildings in all parts of the country, and some work is also coming up for manufacturing plants. Among the latter is a lot of 4500 tons for the new plant of the Interocean Steel Company. The material for the Curtis Building at Philadelphia, about 13,000 tons, has gone to the American Bridge Company.

Rail sales during the week include 15,000 tons for the Gilbert & Pittsburgh, 8100 tons of open hearth rails for the Chesapeake & Ohio, to be rolled at Gary, 5000 tons for the Northern Pacific and 5000 tons for the Central New England Railroad. The St. Paul road is in the market for 45,000 tons, for June and July delivery.

The wire markets show further easing off and rather low prices have been made lately on hoops and bands and on spikes.

The tin plate mills are exceedingly busy.

Moderate lots of cast iron pipe have been awarded lately and some additional business is pending. A Western road has just placed an order for 5000 tons of culvert pipe.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Apr.28, 1909.	Apr.21, 1909.	Mar.31, 1909.	Apr.29, 1908.
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	*$16.00*	$16.25	$16.25	$17.50
Foundry No. 2, Southern, Cincinnati	14.25	14.25	14.25	15.00
Foundry No. 2, local, Chicago	16.50	16.50	16.50	17.70
Basic, delivered, Eastern Pa.	15.00	15.00	15.00	17.25
Basic, Valley furnace	*14.00*	14.00	14.50	15.50
Bessemer, Pittsburgh	*15.65*	15.65	15.90	17.15
Gray forge, Pittsburgh	14.40	14.40	14.40	15.40
Lake Superior charcoal, Chicago	19.50	19.50	19.50	20.00
BILLETS, &c., Per Gross Ton:				
Steel billets, Pittsburgh	23.00	23.00	23.00	28.00
Forging billets, Pittsburgh	25.00	25.00	25.00	30.00
Open hearth billets, Philadelphia	25.40	25.40	25.40	29.20
Wire rods, Pittsburgh	*29.00*	29.00	33.00	35.00
Steel rails, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	**13.50**	13.50	13.00	12.00
Steel rails, melting, Philadelphia	**14.00**	13.25	13.25	12.75
Iron rails, Chicago	**16.50**	16.25	16.00	15.00
Iron rails, Philadelphia	17.00	17.00	17.00	17.00
Car wheels, Chicago	14.50	14.50	14.50	13.00
Car wheels, Philadelphia	14.00	14.00	14.00	14.00
Heavy steel scrap, Pittsburgh	**14.25**	14.00	13.75	12.75
Heavy steel scrap, Chicago	**12.75**	12.50	12.00	10.75
Heavy steel scrap, Philadelphia	**13.50**	13.25	13.25	12.75
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia	*1.35*	1.37	1.37	1.46
Common iron bars, Chicago	*1.25*	1.27½	1.27½	1.65
Common iron bars, Pittsburgh	*1.30*	1.30	1.35	1.50
Steel bars, tidewater, New York	*1.31*	1.26	1.36	1.76
Steel bars, Pittsburgh	*1.15*	1.10	1.20	1.60
Tank plates, tidewater, New York	*1.41*	1.41	1.46	1.86
Tank plates, Pittsburgh	*1.25*	1.25	1.30	1.70
Beams, tidewater, New York	*1.41*	1.41	1.46	1.86
Beams, Pittsburgh	*1.25*	1.25	1.30	1.70
Angles, tidewater, New York	*1.41*	1.41	1.46	1.86
Angles, Pittsburgh	*1.25*	1.25	1.30	1.70
Skelp, grooved steel, Pittsburgh	*1.20*	1.20	1.25	1.55
Skelp, sheared steel, Pittsburgh	*1.30*	1.30	1.35	1.65
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.20	2.20	2.20	2.50
Wire nails, Pittsburgh	*1.80*	1.85	1.95	2.05
Cut nails, Pittsburgh	*1.70*	1.70	1.80	1.90
Barb wire, galv., Pittsburgh	*2.25*	2.30	2.40	2.50
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	*12.87½*	12.87½	13.00	13.00
Electrolytic copper, New York	12.62½	12.62½	12.62½	12.75
Spelter, New York	**5.02½**	5.07½	4.85	4.70
Spelter, St. Louis	**4.95**	4.95	4.70	4.57½
Lead, New York	**4.25**	4.25	4.10	4.10
Lead, St. Louis	**4.15**	4.20	3.97½	4.00
Tin, New York	*29.25*	29.55	29.50	32.25
Antimony, Hallett, New York	7.75	8.00	7.75	8.75
Nickel, New York	45.00	45.00	*45.00	45.00
Tin plate, 100 lb., New York	$3.64	$3.64	$3.64	$3.89

Prices of Finished Iron and Steel F.O.B. Pittsburgh.

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural steels and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Shapes.—I-beams and channels, 3 to 15 in., inclusive, 1.25c., net; I-beams over 15 in., 1.35c., net; H-beams over 8 in., 1.45c.; Angles, 3 to 6 in., inclusive, ¼ in. and up, 1.25c., net; angles, over 6 in., 1.35c., net; angles, 3 x 3 in. and up, less than ¼ in., 1.45c., base, half extras, steel bar card; tees, 3 in. and up, 1.25c., net; zees, 3 in. and up, 1.25c., net; angles, channels and tees, under 3 in., 1.20c., base, half extras, steel bar card; deck beams and bulb angles, 1.60c., net; hand rail tees, 2.70c., net; checkered and corrugated plates, 2.70c., net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.25c., base. Extras over this price are as follows:

Tank, ship and bridge quality, ¼-in. thick on edges, 100 in. wide, down to but not including 6 in. wide, is taken as base.

Steel plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, shall be considered ¼-in. plate. Steel plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Steel plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. shall take the place of 3-16-in.

Percentages as to overweight on plates, whether ordered to gauge or weight, to be governed by the Association of American Steel Manufacturers' Standard Specifications.

Gauges under ¼-in. to and including 3-16-in. plates on thin edges	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
All sketches (excepting straight taper plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete circles	.20
Boiler and flange steel plates	.10
"A. B. M. A." and ordinary firebox steel plates	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Shell grade of steel is abandoned.	
For widths over 100 in. up to 110 in.	.05
For widths over 110 in. up to 115 in.	.10
For widths over 115 in. up to 120 in.	.15
For widths over 120 in. up to 125 in.	.25
For widths over 125 in. up to 130 in.	.50
For widths over 130 in.	1.00

TERMS.—Net cash 30 days. Pacific Coast base, 1.30c., f.o.b. Pittsburgh.

Sheets.—Minimum prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Blue annealed sheets, No. 10 and heavier, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 2.05c. Box annealed sheets, Nos. 17 to 21, 2c.; Nos. 22 to 24, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c. Galvanized sheets, Nos. 13 and 14, 2.30c.; Nos. 15 and 16, 2.40c.; Nos. 17 to 21, 2.50c.; Nos. 22 to 24, 2.65c.; Nos. 25 and 26, 2.85c.; No. 27, 3.05c.; No. 28, 3.25c.; No. 29, 3.35c.; No. 30, 3.60c. Painted roofing sheets, No. 28, 1.55c. per square. Galvanized roofing sheets, No. 28, 2.80c. per square for 2½-in. corrugations.

Wrought Pipe.—Discounts on steel pipe, ¾ to 6 in., in carloads to the largest trade, are 81 and 5 per cent. off list, and on iron pipe, 4½ to 8 in., are 78 and 5 per cent. off list.

Boiler Tubes.—Regular discounts are as follows:

Boiler Tubes.

	Steel.
1 to 1½ in.	50
1¾ to 2¼ in.	62
2¾ to 5 in.	70
2½ in.	64
6 to 13 in.	62

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Wire Rods.—Bessemer rods, $29; chain rods, $29; basic rods, $30.

Chicago.

FISHER BUILDING, April 28, 1909.—(*By Telegraph.*)

To the growing bookings of plates, structural shapes and bars by the leading interest there was added last week 15,000 tons of rails, which will likely be supplemented within a few days by an order from a Western trunk line for 50,000 tons or more. Other purchases of note made by railroads include culvert pipe, of which around 5000 tons has been secured by the leading pipe interest. There is a gradually increasing demand for structural material, and in less degree the same is true of plates and bars. Following the downward tendency of prices noted in last report as applying to these lines, a somewhat firmer feeling has developed, and there is apparently more of a disposition on the part of producers to resist the establishment of lower levels. Wire and wire products, although nominally unchanged, are distinctly weaker, and the shading of regular prices by the leading mills has become more general. Implement makers continue to lead all other manufacturers' interests in point of activity, and are the most liberal buyers in the market. Trade in merchant pipe, boiler tubes and iron bars has not kept pace with other rolling mill products, but is moving slowly.

Pig Iron.—Despite the number of inquiries in the market at the beginning of last week, the actual business placed was relatively small. With the advance of 50c. a ton asked by the leading Southern furnaces, the interest of consumers has waned. Buyers generally seem to have few pressing requirements, and they resolutely decline to contract ahead at the advanced price. It is currently reported that some sales on a basis of $11, Birmingham, have been made since the formal withdrawal of this price, but it is believed that such trades, if any were made, represent the closure of outstanding offers. That the minimum of $11.50, Birmingham, was not uniformly maintained, however, is evident from the fact that some business was taken at $11.25 for second quarter shipment. Sales aggregating 4900 tons for delivery through second and third quarters by a leading Alabama producer are reported. Furnaces in this district are holding their product at $16, from which it is likely that concessions are made under the pressure of competition. The following quotations are for May and June delivery, f.o.b. Chicago:

Lake Superior charcoal	$19.50 to $20.00
Northern coke foundry, No. 1	17.00 to 17.50
Northern coke foundry, No. 2	16.50 to 17.00
Northern coke foundry, No. 3	16.00 to 16.50
Northern Scotch, No. 1	17.50 to 18.00
Southern coke, No. 1	16.35 to 16.85
Southern coke, No. 2	15.85 to 16.35
Southern coke, No. 3	15.35 to 15.85
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	16.35 to 16.85
Southern coke, No. 2 soft	15.85 to 16.35
Southern gray forge	14.35 to 14.85
Southern mottled	14.10 to 14.60
Malleable Bessemer	16.50 to 17.00
Standard Bessemer	17.90 to 18.40
Jackson Co. and Kentucky silvery, 6 %	19.90 to 20.40
Jackson Co. and Kentucky silvery, 8 %	20.90 to 21.40
Jackson Co. and Kentucky silvery, 10 %	21.90 to 22.40

(*By Mail.*)

Billets and Rods.—The lower prices recently established on billets have not been effective in developing new business. No sales other than a few unimportant lots of forging billets are reported this week. We quote rolling billets at $24 and forging billets at $26, Chicago. It is likely that these prices might be shaded on orders of desirable size. Little is doing in wire rods. The leading interest is not pressing for new business in the face of unsettled conditions in the wire market.

Rails and Track Supplies.—Of the 30,000 tons of standard section rails noted as pending in last report, 15,000 tons have been placed by the Gilmer & Pittsburgh Railroad with the Illinois Steel Company; these being open hearth will be rolled at the Gary works. Inquiries for about 50,000 tons now under consideration will likely be placed soon; most, if not all of it, will likely be secured by the leading interest. Not much new business in track supplies is being offered, but specifications for bolts and spikes are coming out fairly well. Light rail orders are by no means plentiful. The regular price of $24 for 25 to 45 lb. sections continues to be shaded more or less, according to the territory in which the business originates.

Structural Material.—In the local market the placing of 2000 tons for the Steger Building was the leading transaction of interest. This will be fabricated by the South Halstead Street Iron Works, and it is understood that the price at which it was taken is indicative of no tendency toward improvement. A contract covering 450 tons for the Washington Water Power Company, Spokane, Wash., for the Post street substation, was secured by the Cambria Steel Company, and 600 tons for a union passenger station at Salt Lake City was awarded to the Richards-Noelke Company. The Minneapolis Steel & Machinery Company will fabricate 160 tons to be used in the construction of the Twin Falls Courthouse, Twin Falls, Idaho. The general contract for the erection of an addition to the Republic Building, Chicago, 790 tons, went to Wilson Brothers, Pittsburgh. It is understood that the order for 1500 tons of bridge material for the Chicago & Alton was placed with the American Bridge Company. Inquiries from the Illinois Central and the Chicago, Rock Island & Pacific railroads are also pending. Among the prospective projects calling for fabricated material are a subbasement of three stories under the Marshall Field wholesale store, with estimated requirements of 2000 tons, and the Old National Bank, Spokane, Wash., 2500 tons, for which plans are being made. Bids are in on 4500 tons for the Inter-Ocean Steel Company's new plant at Chicago Heights. The mills are getting a fairly liberal run of specifications, and the South Chicago mill is running full. There has been no appreciable change in prices, which for this market are fairly represented by 1.40c., Chicago.

Plates.—Considerable improvement is noted in the general demand for plates. Orders, though usually calling for small lots, are more widely distributed, showing an increasing demand from the small shops. The rolling schedules of plate mills are better filled than at any time in the past 18 months. A good many reports of exceptionally low prices are current, but the general disposition of the mills seems to tend toward less aggressiveness in price cutting. The prices governing actual transactions range from 1.40c. to 1.45c., Chicago.

Sheets.—The demand for sheets continues to grow at a moderate rate. Orders from all sources are more liberal. The improvement noted includes not only the lighter gauges of black and galvanized, but there is also a better movement in box annealed sheets. The mill at Indiana Harbor is well filled, with delivery dates running 30 days ahead. It is reported that the Atlanta Tin Plate & Sheet Company's mill, which has been shut down for over a month, is expected to start up in a week or so. Regular prices are on the whole being fairly well maintained, though they are susceptible of some shading.

Bars.—Negotiations under way for season contracts on steel bars, running from July, 1909, to July, 1910, have not as yet resulted in the entry of much such tonnage. The mills are not anxious to fill up so far ahead at the small advance possible over present prices, and are, therefore, not pressing for the closure of such contracts. The leading in-

terest is booking a fairly heavy tonnage, but the independent mills are not as well provided; the latter are running between 65 and 70 per cent. of capacity. Bar iron is in slow demand, and shows but little, if any, improvement. We quote steel bars at 1.30c. to 1.35c., at which prices orders are being entered up to the end of the year; bar iron 1.25c. to 1.30c., all Chicago.

Merchant Pipe.—The opening of navigation has been followed by a little better demand in the Northwest, where water rates offer considerable advantage; orders held back on this account have been added to the current volume of trade. Elsewhere, jobbers continue to buy only in such lots as are required to supply their needs between shipments, and the degree of improvement noted is discouragingly small. The ruling discounts are reported to represent the price basis of practically all transactions.

Boiler Tubes.—Trade in merchant tubes has not perceptibly improved, although orders for small lots for mill shipment are, perhaps, somewhat more numerous. The railroads are buying occasional lots of locomotive tubes for repair work as occasion demands, but the market as a whole has shown little response to the lower prices offered in the late revision of discounts.

Merchant Steel.—With the close of the busy season among agricultural implement dealers there is less demand from this source for merchant steel and the miscellaneous shapes used by these interests. The few new orders being entered represent finishing up requirements and stock assortment needs of the jobbers. Not much activity is looked for in these materials until buying for the new season opens up.

Cast Iron Pipe.—Buying of railroad culvert pipe was the particular feature of market interest last week; bookings of such orders entered by the leading interest amounted to between 4000 and 5000 tons. The contract for 2000 tons let last week by Salt Lake City, Utah, was taken by a local contractor, who has not yet purchased the pipe. The award for the pipe requirements of the city of Dayton, Ohio, has been deferred for a few days, but it is understood that the United States Cast Iron Pipe & Foundry Company was the low bidder. Two lots coming up for letting May 4 include 4000 tons for the city of St. Louis and 2800 tons for Hugho, Okla. In addition to the larger transactions noted, there has been a gratifying increase in the number of small lots placed, and inquiries of the same character are more plentiful. We quote, per net ton, Chicago, as follows: Water pipe, 4-in., $27.50; 6 to 12 in., $26.50; 16 in. and up, $24.50, with $1 extra for gas pipe.

Old Material.—Contrary to the tendency of prices in new material, scrap is not only holding its recent gain in values, but continues to show an upward tendency. It is favored in this respect by the small amount of material coming into the market from the railroads and other sources. The dealers are still holding a large surplus of yarded stock, but prices have not advanced far enough as yet to permit of its disposal at a profit; and, since most of it is in strong hands, it is consequently not being unloaded. Owing to the fact that consumers are likely to be conspicuous among the bidders on 4000 tons to be offered this week by the Chicago, Burlington & Quincy, it is expected that prices above the present market will be developed. There is a better inquiry for car wheels, which at current prices are relatively cheaper for general foundry use than pig iron. The tonnage available in the open market, however, is small. The following prices are per net ton f.o.b. Chicago:

Old iron rails	$16.50 to $17.00
Old steel rails, rerolling	13.25 to 14.25
Old steel rails, less than 3 ft	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	22.50 to 23.50
Old car wheels	14.50 to 15.00
Heavy melting steel scrap	12.75 to 13.25
Frogs, switches and guards, cut apart	12.75 to 13.25
Mixed steel	10.50 to 11.00

The following quotations are per net ton:

Iron fish plates	$14.75 to $15.25
Iron car axles	17.25 to 17.75
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	12.50 to 13.00
No. 2 railroad wrought	11.50 to 12.00
Springs, knuckles and couplers	11.75 to 12.25
Locomotive tires, smooth	13.00 to 13.50
No. 1 dealers' forge	9.00 to 9.50
Mixed busheling	8.00 to 8.50
Iron axle turnings	7.00 to 7.50
Soft steel axle turnings	6.50 to 7.00
Machine shop turnings	6.50 to 7.00
Cast borings	5.25 to 5.75
Mixed borings, &c.	5.25 to 5.75
No. 1 Mill	7.00 to 7.50
No. 2 mill	6.00 to 6.50
No. 1 boilers, cut to sheets and rings	8.50 to 9.00
No. 1 cast scrap	13.00 to 13.50
Stove plate and light cast scrap	11.25 to 11.75
Railroad malleable	11.75 to 12.25
Agricultural malleable	10.50 to 11.00
Pipes and flues	8.50 to 9.00

Metals.—Consumers of copper apparently see nothing in the trend of prices or prospective increase in demand that calls for purchases of greater quantities of metal than are required to supply nearby needs. As compared with the number of inquiries received, the actual sales resulting from them are small. Tin shows a little more firmness, due, perhaps, to the anticipation of favorable adjustment of the tariff schedules applying to this metal. Lead is steadier and firmer, but there is not much improvement in the demand. Quotations are as follows: Casting copper, 12¾c. to 13c.; lake, 13¼c. to 13½c., in car lots, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, car lots, 31c.; small lots, 33c.; lead, desilverized, 4.15c. to 4.25c., for 50-ton lots; corroding, 4.40c. to 4.50c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; spelter, 5.25c. to 5.35c.; Cookson's antimony, 10½c., and other grades, 9¾c. to 10¼c.; sheet zinc is $6.75, f.o.b. La Salle, in car lots of 600-lb. casks. On old metals we quote: Copper wire, crucible shapes, 13c.; copper bottoms, 11¼c.; copper clips, 11c.; red brass, 11¼c.; yellow brass, 9c.; light brass, 7c.; lead pipe, 3.75c.; zinc, 2½c.; pewter, No. 1, 21c.; tin foil, 23c.; block tin pipe, 26c.

Cleveland.

CLEVELAND, OHIO, April 27, 1909.

Iron Ore.—The first ore cargo of the season to reach a Lake Erie port arrived at Ashtabula from Escanaba April 25. Navigation to Lake Superior became open April 26 by the passage of boats through the St. Mary's River at Sault Ste. Marie. About 40 of the big steamers of the Pittsburgh Steamship Company have been placed in commission and are on their way to the head of Lake Superior for ore cargoes. In spite of the labor troubles vesselmen are getting all the men needed to operate the boats that are going in commission, and members of the Lake Carriers' Association state that more boats have started out than business at present demands. Members of the Lake Seamen's Union have voted in favor of a strike on all vessels that are enrolled in the Lake Carriers' Association because of the open shop rule, and it is expected that the union seamen will be ordered to strike before the end of the week. There have been some additional ore reservations, but the sales reported are only a few small lots. Ore is moving from the docks fairly well. Ore prices at Lake Erie docks, per gross ton, are as follows: Old Range Bessemer, $4.50; Mesaba Bessemer, $4.25; Old Range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—The active buying movement that started two weeks ago continues, and sales aggregating over 60,000 tons were made by local interests during the week. This is exclusive of the purchase of 24,000 tons of Nos. 2, 3 and 4 foundry iron by the Massillon Iron & Steel Company for delivery from May to October, inclusive. A large share of this business is understood to have gone to a Valley furnace at about $14 for No. 2 and $13.75 for No. 3. While a number of good inquiries are still pending they are not quite as numerous as they were, and buying has been somewhat checked by higher quotations on foundry iron made by a number of producers. There has been considerable stiffening of prices by local furnaces and some of the Valley interests, and these are now asking $14.50, at furnace, for No. 2 foundry for last half delivery. Although it is probable that some iron can still be bought at $14, Valley furnace, for No. 2 the tonnage is limited. For Cleveland delivery local furnaces have advanced their price to $15 for No. 2. Some iron has been sold at $14.50, local furnace, for outside shipment. The largest sale reported for delivery in this territory is 3000 tons of No. 2. Other sales by a local furnace include 1200 tons of No. 3 to an Ohio pipe plant and 1200 tons of No. 3 to the Akron plant of the International Harvester Company. A local interest also sold a round lot to go to the Detroit plant of the leading radiator interest. While the bulk of the tonnage sold during the week was foundry iron, a considerable quantity of malleable was bought by some of the large consumers. One malleable inquiry is now pending for 3000 tons. Among the new foundry iron inquiries is one from a Niles boiler manufacturer for 3000 tons. There are some inquiries for small lots of basic. For last half delivery we quote No. 2 foundry at $14 to $14.50, Valley furnace. For second and third quarter delivery we quote delivered, Cleveland, as follows:

Bessemer	$15.90
Northern foundry, No. 1	$15.15 to 15.50
Northern foundry, No. 2	14.75 to 15.15
Northern foundry, No. 3	14.25 to 14.75
Gray forge	13.90 to 14.40
Southern foundry, No. 2	15.60 to 15.85
Jackson County silvery, 8 per cent. silicon	20.05

Coke.—Little business is coming out and prices are unchanged. Connellsville furnace coke is quoted at $1.50 to $1.65, at oven, for spot shipment and $1.70 to $1.80 on contract. We quote standard 72-hr. foundry coke at $1.90 to $2.15 for spot shipment and $2 to $2.25 on contract.

Finished Iron and Steel.—The leading interest and one important independent producer that has been unusually active in the market in the past two weeks are now holding for firmer prices on steel bars, plates and structural material. The leading interest is now quoting 1.15c., Pittsburgh, as its minimum price on steel bars for prompt shipment and for the balance of the year, specifications to be in not later than December 1. Changing its recent policy of not looking for contracts for future delivery, this interest has become very

active this week in booking bar contracts for the balance of the year, and has taken on a large tonnage, including several 1000-ton lots. Other mills are also firmer on prices, and 1.15c., Pittsburgh, now seems to be the minimum price all round on steel bars, with some mills holding to 1.20c. for small orders. Plates and shapes are also firmer, 1.25c., Pittsburgh, being quoted as the lowest price. The leading interest is quoting on plates and shapes at this price only for prompt shipment, and is not seeking contracts. All mill agencies report a good volume of business booked during the week and a satisfactory number of inquiries coming out. The demand for plates shows an improvement, some good orders having come from boiler shops that are now quite busy. The structural outlook continues very good, considerable tonnage coming out in small orders. The County Commissioners have finally awarded the contract for the Denison-Harvard Bridge, Cleveland, 6300 tons, to the King Bridge Company on a bid of $49.90 per ton. It is understood that the steel will be furnished by the Lackawanna Steel Company. Among new structural contracts awarded during the week was a building for the Diamond Rubber Company, Akron, 1000 tons, to the Berger Iron Works, Akron, and a building for the B. F. Goodrich Company, Akron, 850 tons, to the Interstate Engineering Company, Bedford, Ohio. The American Shipbuilding Company has taken a contract for a small boat, and placed the contract for the plates, shapes and bars required, 800 tons, with the leading interest. The demand for sheets is fairly active. Some contracts for the balance of the year are being closed at a slight concession in prices. The demand for iron bars is very light. The general price quotation is 1.25c., Cleveland.

Old Material.—Inquiries are coming in a little more freely, a few being for round lots, but no improvement is noticed in actual transactions. A better feeling prevails and prices are somewhat firmer, although most price quotations remain stationary. Dealers look for an improvement in the market soon, and not much scrap is offered at present prices. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$13.00 to $13.50
Old iron rails	15.50 to 16.00
Steel car axles	17.00 to 17.50
Old car wheels	14.00 to 14.50
Heavy melting steel	12.00 to 12.50
Relaying rails, 50 lb. and over	21.50 to 22.50
Agricultural malleable	11.00 to 11.50
Railroad malleable	12.25 to 12.75
Light bundled sheet scrap	7.50 to 8.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$17.00 to $17.50
Cast borings	6.00 to 6.50
Iron and steel turnings and drillings	6.75 to 7.25
Steel axle turnings	9.00 to 9.50
No. 1 busheling	10.00 to 10.50
No. 1 railroad wrought	12.00 to 12.50
No. 1 cast	11.50 to 12.00
Stove plate	10.00 to 10.50
Bundled tin scrap	9.00

Philadelphia.

PHILADELPHIA, PA., April 27, 1909.

A somewhat better volume of business has been transacted in some lines of both crude and finished materials. The low prices made for certain classes of finished material have brought out considerable tonnage, the most important transaction being the placing of the contract for structural material for the Curtis Building with the American Bridge Company, at what is reported to be an extremely low figure. There has been a better movement in pig iron, several round lots being sold for early delivery. The first movement in basic iron for a long time was made during the week, sales of several thousand tons for early delivery having taken place. Billets and sheets continue extremely dull, with prices weak. The scrap market is firmer on moderate inquiry. The Eastern Pig Iron Association, which met in this city last week, has, in view of the proposed tariff of $2.50 per ton on pig iron, reconsidered its former action regarding the duty on iron ore, and under the existing circumstances favors its free importation.

Pig Iron.—More active buying is noted. While transactions are still principally in small lots, there have been some much larger sales for deliveries extending into the third quarter. There is more inquiry for foundry grades, particularly for extended deliveries, for which buyers would place fairly good contracts if the iron could be had at current prices, which are believed to be at the bottom. Sellers, however, are not anxious for orders on which deliveries extend over the last half of the year, and if possible avoid quoting for such terms. When quotations are made it is the usual custom to add 25 cents a ton to present prices for deliveries extending into July and August, and for strictly third quarter shipment 50 cents a ton is added, while in some cases iron for fourth quarter delivery commands $1 advance. Merchant furnaces are in a fairly good condition regarding stocks on their banks. While there is an accumulation, it has not become as large as was anticipated, particularly in the foundry grades; owing to the curtailment in deliveries ordered by the steelmakers, furnaces producing basic iron show a more rapid increase in stocks, but there has not been sufficient to warrant any further curtailment in the output. The cast iron pipe interests are still in the market for a considerable tonnage of low grade iron, and a sale of some 3000 tons of Northern iron for early shipment has been reported at a shade under $15, delivered. Northern irons of this grade are becoming somewhat scarce. Sales of the higher grades of foundry iron have been mostly in moderate lots for early shipment at prices running from $16 to $16.25, delivered, for No. 2 X. One interest disposed of an aggregate of 8000 tons for delivery outside the immediate territory at prices equal to the above named range. Southern foundry grades have not been active; inquiries are out for low grade iron, but no extensive business has been taken. Prices of Southern iron are stiffer, $11 to $11.50, Birmingham, for No. 2 foundry being the basis named. Virginia grades have been a little more active; some scattered sales, with an occasional round lot, being reported at unchanged prices. More activity is noted in forge iron, miscellaneous lots have been sold at $14.75 to $15, delivered, and one round block was taken on the basis of $14.50, furnace. The first movement in steelmaking irons for a long time occurred during the week, sales of some 6000 tons of basic being reported for early shipment at $15, delivered. Low phosphorus remains quiet, with practically no demand and quotations entirely nominal. For early delivery concessions have been made on some grades, but prices are believed to be at the bottom and advances for delivery beyond the first half of the year are becoming more general. We quote as follows for deliveries in buyers' yards, eastern Pennsylvania and nearby points, for the remainder of the present quarter:

Eastern Pennsylvania, No. 2 X foundry	$16.00 to $16.50
Eastern Pennsylvania, No. 2 plain	15.50 to 16.00
Virginia, No. 2 X foundry	16.50 to 16.75
Virginia, No. 2 plain	16.25 to 16.50
Gray forge	14.75 to 15.00
Basic	15.00 to 15.25
Low phosphorus	20.00 to 20.50

Ferromanganese.—While there is a little more inquiry for small prompt lots, no business of any size comes out. Eighty per cent. ferro is nominally quoted at $42, Baltimore, but this price could be shaded 50c. to $1 on a firm inquiry.

Billets.—The demand is extremely light. Mills are taking on very little business and prices are weaker. While there has not been sufficient business to test the market, sellers would no doubt shade the regular quotation of $25.40 for ordinary rolling steel delivered in this territory. Forging steel is nominally quoted at $27.40 delivered, the customary extras applying.

Plates.—There has been a slight falling off in the volume of business taken. Specifications come out freely, but are usually for small lots. A number of fairly good propositions are pending, but close slowly. The usual run of business is small and mills are not gaining very much in production. Prices are not strong, the ruling quotation for ordinary plates being 1.45c. delivered in this territory, the usual extras applying. In some cases better prices are realized, but concessions can also be had for desirable orders.

Structural Material.—The most important transaction during the week was the placing of the contract for 14,000 tons of material for the Curtis Building with the American Bridge Company; the price has not been made public, but is understood to have been very low. Other propositions covering round lots of structural shapes for building and viaduct work are under consideration, but have not yet been closed. There has been a pretty fair run of general business and the outlook for the future is considered good. Prices on plain material in moderate lots for delivery in this territory continue firm at 1.45c. to 1.50c., according to specification.

Sheets.—The volume of business coming out is extremely light, consumers only taking enough to cover their immediate needs. Mills are not actively engaged, and while the following range of prices is quoted for small, prompt lots, delivered in this territory, they could, no doubt, be shaded $1 a ton if a satisfactory volume of business were offered: Nos. 18 to 20, 2.40c.; Nos. 22 to 24, 2.50c.; Nos. 25 and 26, 2.60c.; No. 27, 2.70c.; No. 28, 2.80c.

Bars.—The demand continues of an irregular nature, buyers taking moderate lots, largely for immediate consumption. Increased sales of steel bars are reported, owing to the recent reduction in price. Prices of iron bars still show considerable variation, dependent upon specification and size. For delivery in this territory refined iron bars are quoted from 1.35c. to 1.45c.; common bars, 1.25c. to 1.35c.; steel bars, 1.30c. to 1.35c.

Coke.—A little better buying of foundry coke is reported, but not in large lots. Transactions are mostly for fairly prompt delivery. While low priced coke is still available, the better grades are firmer. Furnace coke is quiet. The following range of prices is named for delivery in this vicinity:

Connellsville furnace coke	$3.75 to $3.90
Foundry coke	4.15 to 4.40
Mountain furnace coke	3.35 to 3.50
Foundry coke	3.75 to 4.00

Old Material.—While there has been no heavy buying, inquiries by consumers have stiffened the market and higher prices are named on a number of grades. Heavy melting steel has been bought in small lots. Machinery cast and railroad wrought are more active, and a fair demand for several other grades is noted. The tone of the market is better, and quotations, while still nominal on a number of grades, range about as follows for prompt delivery in buyers' yards, Philadelphia and nearby points:

No. 1 steel scrap	$13.50 to $14.00
Steel rails and crops	14.00 to 14.50
Low phosphorus	17.00 to 18.00
Old steel axles	17.25 to 17.75
Old iron axles	18.50 to 19.50
Old iron rails	17.00 to 17.50
Old car wheels	14.25 to 14.75
Choice No. 1 R. R. wrought	16.00 to 16.50
Machinery cast	14.50 to 15.00
Railroad malleable	13.25 to 13.75
Wrought iron pipe	13.75 to 14.25
No. 1 forge fire scrap	12.00 to 12.50
No. 2 light iron	8.50 to 9.00
Wrought turnings	10.50 to 11.00
Stove plate	11.75 to 12.25
Cast borings	9.00 to 9.50
Grate bars	12.00 to 12.50

Pittsburgh.

PARK BUILDING, April 28, 1909.—(*By Telegraph.*)

Pig Iron.—Reports of active pig iron markets in the East, in the Chicago District, and in the Central West, while encouraging, do not represent conditions in the pig iron trade in the Pittsburgh District, which are excessively quiet. The only transaction of moment in this market for some time was the Westinghouse purchase last week, about 10,000 tons, and the only large inquiry at present is that of a local consumer for 3000 tons of iron for last half delivery, comprising 2000 tons of Northern No. 2, 500 tons of low phosphorus iron and 500 tons of standard Bessemer. Practically all the local furnaces that make these grades of iron have put in bids on this business, and it is expected to be closed to-day. We quote Bessemer iron at $14.75 to $15; basic, $14; malleable Bessemer, $14.25; No. 2 foundry, $14 to $14.25, and gray forge, $13.50, all at Valley furnace, the freight rate to Pittsburgh being 90c. a ton.

Steel.—Few inquiries for billets, sheet or tin bars are in the market, but specifications against contracts are coming in at a fairly satisfactory rate. Nominal prices are $23 for billets and $25 for sheet and tin bars, but these prices have been shaded.

(*By Mail.*)

Further evidence that the turn has come and that the steel trade is on the mend is shown by the fact that the Carnegie Steel Company has made an advance of virtually $1 a ton on plates, structural shapes and steel bars, and has also decided that under no conditions, except in the case of a large structure that could not be completed within a year, would it sell material for delivery beyond January 1, 1910. The company has adopted minimum prices on the rolled products named, and they are now showing a stronger tone. Several other leading steel companies have also adopted the same policy. The Carnegie Company has entered some very heavy orders on these and other products for delivery in second and third quarters, and in some cases for the last quarter, and believes that the situation fully warrants the action taken. It will probably result in some belated contracts being placed, which were being held up in the hope of lower prices. The general situation is showing betterment, as more orders are being placed and there are decidedly more inquiries. It is realized that Bessemer pig iron at $14.75 at Valley furnace, and basic and foundry at $1 a ton less, do not leave much, if any, profit to the furnaces, and several large consumers are now trying to buy for the balance of this year and into next year at present prices, but so far local furnaces are refusing to sell for delivery so far ahead. Specifications against contracts for billets and sheet and tin bars are coming in better than for some time. On finished iron and steel in general the mills are booking more orders than at any time in the past 18 months, and prices are showing a firmer tone. There is a fair inquiry for scrap, with prices fairly strong, but the coke trade is lagging and prices are dull and weak. The consensus of opinion seems to be that when the last quarter of the year is reached the steel trade will be back again into nearly normal condition.

Ferromanganese.—There is a fair amount of new inquiry. We continue to quote 80 per cent. foreign ferro at $41 to $41.50, Baltimore, or $42.95 to $43.45, Pittsburgh. A sale of about 75 tons is reported to have been made to an Ohio consumer on the basis of about $41, seaboard.

Ferrosilicon.—We note a sale of two cars to a local consumer on the basis of about $58, Pittsburgh, and we quote 50 per cent. at that price.

Rods.—We continue to quote Bessemer wire and chain rods at $29 and open hearth at $30, f.o.b. Pittsburgh. Not many new orders are being placed, but specifications against contracts for chain rods are coming in fairly well.

Skelp.—A local steel company is reported to have bought a fair tonnage of grooved steel skelp of the lighter gauges at a relatively low price. Mills rolling grooved and sheared iron plates are pretty well filled up, particularly on the latter. We quote grooved steel skelp at 1.20c. to 1.25c.; sheared steel, 1.30c. to 1.35c.; grooved iron, 1.40c. to 1.45c., and sheared iron, 1.50c. to 1.55c. for ordinary widths, all f.o.b. Pittsburgh.

Steel Rails.—The Carnegie Steel Company has taken an order from the Pennsylvania Railroad for 5400 tons of standard sections, and is also receiving specifications against contracts ranging from 300 to 1000 tons. This company took orders and received specifications against contracts last week for about 2200 tons of light rails, and so far this week has taken close to 2500 tons, so that this week in light rails promises to break all records for some time. Standard sections remain at $28, at mill, while light rails, 25 to 45 lb., rolled from billets, are $22 to $23, and 16 to 20 lb., $23 to $24, maker's mill. On rerolled rails these prices might be shaded possibly $1 a ton. Splice bars are firm, at 1.50c., at mill.

Plates.—The Pressed Steel Car Company is reported to have orders on its books for about 7000 cars; the Standard Steel Car Company at Butler is running from 35 to 40 per cent. of capacity, and the American Car & Foundry Company is operating at about the same rate, so that the car companies are now taking out a larger tonnage in plates than for some months. Practically all the plates and shapes for these interests are furnished by Pittsburgh mills. It now develops that the inquiry of a large copper company in Arizona is for 7000 to 8000 tons of plates to be used in building a riveted water line in that State. Eastern and local plate mills have this inquiry, and it will probably bring out some low prices. The general demand from boiler shops and other consumers of plates is fair, but there is room for improvement. The regular price of plates ¼ in. and heavier in carloads and larger lots is about 1.25c., but it is possible that this price might be shaded on a very attractive order. On small general orders 1.30c., at mill, is quoted.

Structural Material.—The McClintic-Marshall Construction Company has taken some steel buildings for the Youngstown Sheet & Tube Company, about 700 tons. The contract for the Denison-Harvard Bridge in Cleveland, originally placed with the McClintic-Marshall Construction Company, has been given to the King Bridge Company on what is said to be a technicality, and the matter is to be taken into the courts for a decision. A very large amount of work is coming up, and prices seem to be hardening. The Carnegie Steel Company has announced a minimum price on structural steel below which it will not go, and which amounts to an advance of virtually $1 a ton. An immense amount of business is being figured on, some of which is about ready to close up. The general price on beams and channels up to 15-in. is now reported as being pretty firmly held at 1.25c., and one leading interest has stated that it will not shade that figure. On small lots in less than carloads, 1.30c. f.o.b., Pittsburgh, is quoted.

Bars.—The leading mills rolling steel bars have now more orders on their books than at any time in the past 18 months, and it is believed that prices have not only reached bottom, but that an upward turn has started. The Carnegie Steel Company has made an advance of $1 a ton and has absolutely decided not to sell for delivery beyond January 1, 1910. This will also likely be the policy of other leading mills, and consumers, who have been holding back orders, expecting to buy at close to 1c., will probably be disappointed. New orders are coming in freely and specifications against contracts are very satisfactory. The demand for iron bars continues light, and prices are only fairly strong. We quote steel bars at 1.15c. in large lots, and it would be much more difficult to shade this price at present than it was last week. For the general run of orders 1.20c., at mill, is quoted. We quote common iron bars at 1.30c. to 1.35c., Pittsburgh.

Tin Plate.—The leading mills are operating steadily and ship out their product about as fast as made, most of it going to the canning trade. Indications all point to a heavy consumption by the canning interests this year, and the active opening up of the building season has also increased the demand for terne plate. The American Sheet & Tin Plate Company is operating this week 201 tin mills out of 212, or about 95 per cent., and the leading outside mills, such as Pope, McKeesport, Standard, Griffiths Charcoal Iron Mills and Washington Tin Plate Company, are all operating to practically full capacity and have plenty of orders. We con-

tinue to quote 100-lb. cokes at $3.40, and it is stated that this price is being firmly held.

Sheets.—The demand for sheets does not show the improvement expected. While more orders are being placed now than was the case 60 days ago, trade is not up to expectations. The American Sheet & Tin Plate Company is operating this week 103 sheet mills out of a serviceable capacity of 167 mills, and is also running seven out of eight jobbing mills and one out of two small plate mills that roll the lighter gauges. The tone of the market is fairly strong, but regular prices on galvanized roofing sheets are being shaded. We quote one pass box annealed black sheets No. 28 gauge at 2.20c., and galvanized of the same gauge, 3.25c. The regular price of painted roofing sheets No. 28 is 1.55c. per square, and of galvanized No. 28 is 2.80c. per square for 2½-in. corrugations, but prices on the latter items are being shaded.

Hoops and Bands.—A few orders are being placed for small lots to cover current needs. Competition among the mills is more aggressive than for some time. The normal price of hoops is 1.60c., and bands 1.20c., with steel card extras on the latter, but these prices are being materially shaded on any attractive orders coming up.

Spelter.—The market is decidedly firm and the demand is better than in a long time. We quote prime Western grades at 4.95c. to 5c., East St. Louis, the freight to Pittsburgh being 12½c. per 100 lb.

Railroad Spikes.—Few new orders are being received from the railroads, and these are mostly in small lots to cover repairs, and not for new track laying. Some time ago several of the leading spike makers took some fairly large contracts for spikes, and these have about all been specified for, so that the spike makers have not many orders ahead of them. We quote railroad spikes at $1.65 to $1.70 for 5½ x 9-16 in. and $1.75 to $1.80, base, for the smaller sizes, in carload lots, 5c. additional per keg being charged for small lots.

Merchant Pipe.—New orders entered for both iron and steel pipe so far this month compare very favorably with the same period in March, and one leading interest reports that its new business this month is heavier than in March. Some very large inquiries are in the market for pipe for gas and oil line projects, but these are developing slowly. It is stated that regular discounts on both iron and steel pipe are being maintained, the minimum of the market on steel pipe, ¾ to 6-in., being 81 and 5 per cent., and on iron pipe, 78 and 5 per cent. off list.

Boiler Tubes.—The demand for both locomotive and merchant boiler tubes continues very dull, and does not show signs of early improvement. In spite of the low discounts adopted by the mills some time ago on boiler tubes, it is stated that several are shading these discounts to some extent.

Iron and Steel Scrap.—The demand for scrap from consumers continues light, most sales now being made being between dealers. Several large consumers of heavy steel scrap would take in material if they could get it at their own prices, but dealers refuse to meet their figures. The better feeling in the steel trade has extended to scrap, and dealers are not so much inclined to name lower prices to get business as they were some time ago. Dealers quote per gross ton f.o.b. Pittsburgh, unless otherwise stated, as follows: Heavy steel scrap for Monessen, Pa., or Steubenville, Ohio, delivery, $14.50, and for Pittsburgh delivery $14.25; cast iron borings, $7.75 to $8; bundled sheet scrap, $10.50 to $11 at point of shipment; No. 1 cast, $13.50 to $14; No. 2, $12 to $12.50; No. 1 railroad malleable, $14; sheet bar crop ends, $16 to $16.50; low phosphorus melting stock, $16.25 to $16.50; rerolling rails, $14.25 to $14.50; steel axles, $17 to $17.50; grate bars, $10.50 to $11; old car wheels, $14.75 to $15; machine shop turnings, $9 to $9.25; locomotive tires, $16.50 to $16.75; locomotive axles, $22 to $22.50; iron rails, $15.50; iron axles, $18 to $18.50.

Coke.—The efforts of a number of independent coke operators to hold the price of standard grades of furnace coke for prompt shipment at $1.75 a net ton at oven have been abandoned, as it was found not to be feasible. A leading local consumer recently closed a contract for 10,000 tons of furnace coke per month for last half of the year shipment on a sliding scale basis of so many tons of coke for one ton of basic iron. We quote standard grades of furnace coke for prompt shipment at $1.60 to $1.65, and foundry coke at $1.85 to $1.90 at oven. On contracts for furnace coke for last half of the year shipment $1.80 to $1.85 at oven, and on standard 72-hr. foundry $2.10 to $2.25 are quoted.

The Pennsylvania Malleable Company, Farmers' Bank Building, Pittsburgh, is operating its plant at McKees Rocks at about 75 per cent. of capacity, and reports that inquiries and orders are increasing. The company is engaged in the manufacture of castings for railroad equipment, and a large share of its output is taken by the Pressed Steel Car Company.

St. Louis.

ST. LOUIS, April 26, 1909.

Local conditions in coke, iron and steel are gradually working into better shape. Even old material, which had seemingly no friends, is in demand. General business conditions are fairly good, though some lines are affected unfavorably by the threatened prohibitory legislation now pending in the State Legislature. The prospective work by the city and by steam and street railroad companies, together with other public and semi-public building operations, is assuming large proportions and means much to business men, mechanics and laborers in all lines in the near future.

Coke.—Leading brokers report an active market for coke, with a good inquiry. Sales are mainly of moderate quantities, though inquiries pending embrace some lots of good size. While prices are no higher, the feeling is better, and the opinion is growing that if the demand gains in volume and urgency a good advance is certain to take place in the near future. Among the inquiries reported is one for 1500 tons and another for 800 tons, with several expressed in car lots ranging from 10 to 50. Most of the inquiries refer to shipment over a year's time, while actual sales are mainly for shipment the next two months. For 72-hr. standard Connellsville, $2 is asked for prompt and $2.25 for year's delivery f.o.b. oven.

Pig Iron.—Some of the principal houses have made very good sales of pig iron, and are also in receipt of numerous inquiries. They report that the business is not confined to Southern, but takes in irons of all grades. The De Camp-Yale Iron, Coal & Coke Company reports the sale of 4000 tons of basic iron to a local foundry for delivery in April, May and June, with inquiries aggregating around 10,000 tons for shipment over the last half. Another broker reports sales of 1000 tons of Virginia and Northern iron for shipment over the last half. Business with some sales agencies is restricted on account of the furnaces which they represent confining their quotations to shipment over the second quarter, and refusing to name a price for second half. Specifications on contract are coming in quite freely and requests are being received asking shipments anticipated. A limited amount of standard brands of Southern No. 2 foundry could likely still be bought at $11, Birmingham, for shipment prior to July 1, but for second half we do not find quotations of less than $11.50. One sale of 200 tons of ferrosilicon, 50 per cent., is reported by a leading broker.

Old Material.—A strong feeling, with a firmer market, but no general advance in prices, is reported. The demand is somewhat better and a further improvement is looked for. Old car wheels are the only item on which an advance is asked. Relaying rails continue scarce and wanted. There are no offerings reported by the railroads. Consumers are more generally in the market. We quote, per gross tons, f.o.b. St. Louis, as follows:

Old iron rails	$14.50 to $15.00
Old steel rails, rerolling	12.50 to 13.00
Old steel rails, less than 3 ft.	12.00 to 12.50
Relaying rails, standard sections, subject to inspection	23.50 to 24.00
Old car wheels	14.50 to 15.00
Heavy melting steel scrap	12.00 to 12.50
Frogs, switches and guards, cut apart	12.00 to 12.50

The following quotations are per net ton:

Iron fish plates	$13.00 to $13.50
Iron car axles	16.50 to 17.00
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	10.50 to 11.00
Railway springs	10.00 to 10.50
Locomotive tires, smooth	11.50 to 12.00
No. 1 dealers' forge	9.00 to 9.50
Mixed borings	4.50 to 5.00
No. 1 boilers, cut to sheets and rings	7.50 to 8.00
No. 1 cast scrap	10.50 to 11.00
Stove pipe and light cast scrap	8.00 to 8.50
Railroad malleable	8.50 to 9.00
Agricultural malleable	8.00 to 8.50
Pipes and flues	8.00 to 8.50
Railroad sheet scrap	7.50 to 8.00
Railroad grate bars	8.50 to 9.00
Machine shop turnings	7.00 to 7.50

Lead, Spelter, &c.—Lead is in improved demand and held at 4.15c. Lead ore is quoted at $28.50 per 1000 lb., Joplin base. Spelter is offered at 4.95c. to 5c., East St. Louis; zinc ore $40 to $41 base. The inquiry is broadening, and there is a better feeling. Tin is ⅛c. higher; antimony unchanged, and copper steady. The demand for metals has improved.

The St. Louis Car Company is advertising for first class carbuilders and mill machine hands.

A large company engaged in the manufacture of machinery and appliances for sanitary dairy plants and creameries is about to remove from its present location in one of the northern cities and establish itself at St. Louis. The new plant, including the land, will involve the expenditure of about $250,000, and transfer to this city a manufacturing concern employing a large number of employees and property interests valued at $2,000,000. The reasons assigned for the change are the development of the Southwest terri-

tory, together with the more favorable rates on its raw material from Alabama and Tennessee.

Cincinnati.

CINCINNATI, OHIO, April 28, 1909.—(*By Telegraph.*)

There is a better feeling in iron and steel, and the month is closing quite acceptably to the sales agencies in this market. The application for a franchise for a rapid transit elevated and underground entrance into Cincinnati by John E. Bleekman of New York, president of the Southwestern Ohio Traction Company, which is to be followed on Monday by its introduction at the City Council meeting, and the general belief that the deal, which involves the expenditure of close to $5,000,000 will go through, have had a tendency to inspire confidence. In the tool markets a feature has been the opening up of export trade, some very good orders having been shipped during the week. Advices received this afternoon that the leading steel interest had advanced prices on plates, bars and shapes $1 per ton increased the interest in finished lines.

Pig Iron.—The week has seen some excellent sales of iron in the West and Northwest and some keen competition for business between the Valley and Southern and southern Ohio furnaces. The stove manufacturers are beginning to take an interest in the market. An Ohio manufacturer asks for prices on 500 tons of foundry iron for early delivery. A northern Ohio locomotive works asks for prices on 1000 tons of foundry iron, both Northern and Southern. A Michigan concern making special castings bought some analysis iron, about 600 tons, at around $11.25, Birmingham, for early delivery. An Illinois concern asking for prices on 3500 tons of iron, divided between Northern and Southern, is reported to have bought the Southern. There are numerous inquiries ranging from a carload or two to a half dozen. One or two Southern interests are still accommodating their customers with spot iron on the basis of $11, Birmingham, but for third quarter the price is held rather firmly at $11.50, and for fourth quarter, $12. A firm offer of a round lot, deliveries to run from May to December, would probably bring out a price of $11.75. Low grades are still very scarce, and large Southern interests having forge and No. 4 foundry on their yards are holding it rather firmly at $10.50 to $10.75 for forge and giving preference to those buying foundry with it. The southern Ohio furnaces are not particularly aggressive, and the price is still held at $14 for No. 2, Ironton furnace. There is considerable inquiry for basic and also some for malleable. For early delivery and balance of second quarter, f.o.b. Cincinnati, the freight rate being $3.25 from Birmingham and $1.20 from Hanging Rock, we quote as follows:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 14.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern coke, gray forge	13.75 to 14.00
Southern mottled	13.25 to 13.75
Ohio silvery, 8 per cent. silicon	19.70
Lake Superior coke, No. 1	15.70 to 16.20
Lake Superior coke, No. 2	15.20 to 15.70
Lake Superior coke, No. 3	14.70 to 15.20
Standard Southern car wheel	22.25 to 23.25
Lake Superior car wheel	21.75 to 22.75

(*By Mail.*)

Coke.—Sales agencies report a little increase in interest for future needs in the foundry grades, with some contracting. Prices are unchanged, save that there has been a little shading of spot foundry coke, which is quoted at $2 to $1.90, at oven. Spot furnace grades are quotable at $1.65 to $1.75, and for the last three quarters $1.75 to $2, according to grade; spot foundry, $2 to $2.25, and for the last three quarters $2 to $2.50. West Virginia grades, Wise County, $1.60 to $1.90; foundry, $2 to $2.25; Pocahontas, furnace, $1.65 to $1.85; foundry, $1.85 to $2.25.

Structural Material.—There is a distinct improvement in the outlook for structural business in this market; the selling agencies report some good sales in which the jobbing interests have been conspicuous. A large engineering concern reports three substantial business buildings in early prospect which will take 1000 tons or so. Considerable structural business has been contracted here for shipment to the West, which is recovering rapidly from the recent depression. Rumors or sales of structural shapes at 1.20c. are heard frequently here, although the largest interests deny selling anything less than the quoted price of 1.30c., and assert that this price is firmer.

Bars.—Sales of steel bars are increasing in this market. There is as yet little inquiry for iron bars, which are quotable on the basis of 1.30c. to 1.35c., Pittsburgh, or 1.45c. to 1.50c., delivered, at Cincinnati, but this price is said to have been cut lately by smaller local interests.

Sheets.—The demand is slowly increasing, and leading interests report the general volume of business satisfactory with prices well maintained. The uncertainty over crops is holding back inquiries somewhat on material for the canning industries which is expected to show good form by May 1.

Old Material.—The danger of creating a fictitious market and starting another slump on scrap has, in a measure, checked the tendency of the larger interests to force prices on old material. Heavy Melting Steel, which was liberally quoted at $12 and even higher last week, can now be bought at $11.50, Cincinnati. A comparison of prices to-day and one year ago when steel was $5 to $6 higher shows melting steel scrap too high at $12. The price one year ago was $11 to $11.50. Railroad offerings this week include small lots of cast borings and of iron and steel turnings and a large assortment of miscellaneous scrap, including 400 car wheels, from the Cincinnati, Hamilton & Dayton. Dealers' prices to the trade, f.o.b. cars Cincinnati, are about as follows:

No. 1 R. R. wrought, net ton	$11.50 to $12.50
Cast borings, net ton	5.50 to 6.00
Heavy melting steel scrap, gross ton	11.50 to 12.50
Steel turnings, net ton	7.00 to 8.00
No. 1 cast scrap, net ton	11.00 to 11.50
Burnt cast, net ton	8.00 to 8.50
Old iron axles, net ton	16.00 to 16.50
Old iron rails, gross ton	14.50 to 15.50
Old steel rails, short, gross ton	12.00 to 12.50
Old steel rails, long, gross ton	12.00 to 12.50
Relaying rails, 56 lb. and up, gross ton	21.50 to 22.00
Old car wheels, gross ton	13.50 to 14.00
Low phosphorus scrap, gross ton	13.00 to 13.50

Birmingham.

BIRMINGHAM, ALA., April 26, 1909.

Pig Iron.—Recent engagements have in the main consisted of comparatively small lots, and the aggregate of tonnage involved is considerably less than that recorded during the earlier weeks in this month. A higher average price has been received, however, and the transactions are of such a nature that the market is considered decidedly stronger. The market price for deliveries for the remainder of the second quarter and through the third quarter is $11.50, Birmingham. In the case of a small maker $12 is being asked for early shipments and some sales are reported on that basis, although the brand required accounted for the premium. For deliveries in the last quarter, quotations on a basis of $12 are being made by the majority of sellers. There is practically no interest manifested by any parties concerned in the market as to early 1910 deliveries, and it is not probable that a quotation could be elicited. By reason of the recent advance and the established uniform asking price, it is inferred that the reduction in the aggregate stock accumulation by the activity just experienced reaches such a point as to be satisfactory when compared with the present rate of production. Tangible evidence is offered that founders' stocks are much less than formerly and that the melt will shortly be increased materially. In view of these conditions there is some speculation as to the available tonnage at prices now ruling. An advance in quotations on third quarter deliveries is anticipated by some authorities, although the idle producing capacity and preparations that are being made to put that capacity in operation are to be taken into consideration in all cases. The inquiry at this time indicates a fairly satisfactory volume of business the coming week, but no round tonnages are among the considerations.

Cast Iron Pipe.—A contract to cover some 4100 tons of water pipe for the city of St. Louis, Mo., is for letting May 4. The small orders for Southern municipalities to be placed the coming week are more attractive in the aggregate than for some weeks, and recent bond issues are indicative of a further improvement in the demand. The most significant of recent awards was 2000 tons of water pipe for the city of San Diego, Cal., placed with the American Cast Iron Pipe Company, Birmingham, Ala. One or more lots of 500 to 1000 tons for points along the Pacific Coast were also placed with this concern and prices received are satisfactory. By reason of the recent cut in price of cast iron soil pipe the demand for that material has been stimulated very perceptibly. The orders now in hand with soil pipe manufacturers are in such volume that better prices than now prevail are expected, notwithstanding the increase soon to be effected in rate of production.

Old Material.—The market is quiet, with dealers disposed to adhere to prices that have been asked for some weeks. A few bargain lots have changed hands during the week and some small sales of light cast have been made to the trade, but, taken as a whole, existing conditions are very unsatisfactory. We quote dealers asking prices as follows, which are nominal:

Old iron rails	$13.50 to $14.00
Old iron axles	14.50 to 15.00
Old steel axles	12.00 to 12.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	10.00 to 10.50
No. 1 country wrought	9.00 to 9.50
No. 2 country wrought	8.50 to 9.00
No. 1 machinery	10.50 to 11.00
Tram car wheels	10.50 to 11.00
Standard car wheels	12.00 to 12.50
Stove plate and light cast	7.50 to 8.00
Cast borings	4.00 to 4.50

Buffalo.

BUFFALO, N. Y., April 27, 1909.

Pig Iron.—A marked increase in inquiry is taking place and sales are growing heavier right along. A buying movement has apparently set in from all parts of the country and from all interests with the exception of the railroads. A good deal of New England business is developing, both for foundry grades and malleable. In malleable iron inquiries for 20,000 tons were received by one interest the past week, and another interest booked an order for 5000 tons for June delivery, the latter being at something under schedule for canal shipment. Considerable tonnage in foundry grades and malleable has been sold also for New York and vicinity and Hudson River districts. Much of the present inquiry is for third quarter and last half delivery, and furnace men are beginning to consider forward deliveries. In their opinion the awakened demand and the favorable crop prospects and improving conditions presage higher prices, but so far quotations are being made on the schedules prevailing for some time, and prompt deliveries secure slight shadings in some instances. We quote as follows f.o.b. Buffalo for current quarter deliveries:

No. 1 X foundry	$15.75 to $16.00
No. 2 X foundry	15.25 to 15.50
No. 2 plain	15.00 to 15.25
No. 3 foundry	15.00 to 15.15
Gray forge	14.75 to 15.00
Malleable Bessemer	15.25 to 16.00
Basic	15.50 to 15.75
Charcoal	19.50 to 20.00

Finished Iron and Steel.—All of the local agencies report increased inquiry and larger orders for bars, structural shapes, plates and other finished products, and a decidedly optimistic feeling is noted, one interest having closed up more tonnage last week than for any like period since the depression set in. The belief seems general among the trade that the bottom has been reached in prices and that the next step will be upward. Projectors of building and structural propositions have evidently come to the conclusion that the present is the best time to go ahead with such projects and are acting accordingly in the placement of orders. The Riter-Conley Mfg. Company was low bidder for the 1700 tons of structural steel for the Erie Railroad crossings over Bailey avenue, and Williams street subways in this city, and will undoubtedly be awarded the contract. Bids for 400 tons of steel for the McArthur Building, Buffalo, are to be received on Monday next. The Buffalo Structural Steel Company has been given the contract on a percentage basis for the steel for the eight-story addition to the Buffalo Cold Storage Company's plant, and the Pittsburgh Bridge & Iron Works will furnish the structural material for the new plant additions being erected at Niagara Falls by the Development & Funding Company. Bids will be closed this week for steel for the T. H. Symington Company's plant at Rochester, about 1500 tons, and bids will be received this week for the Eastman Company's new factory building at Kodak Park, Rochester, figured for both brick and steel and reinforced concrete construction. If structural steel is used about 1000 tons will be required.

Old Material.—There is some improvement in the demand, especially for turnings and borings. Consumers of heavy melting steel are coming into the market to a small extent, and a better feeling is noticeable among the dealers, who expect increased buying will soon be in evidence. The week's transactions, however, have not been large. Prices remain practically the same as last week. We quote as follows per gross ton, f.o.b. Buffalo:

Heavy melting steel scrap	$13.00 to $13.50
Low phosphorus steel scrap	17.50 to 18.00
No. 1 railroad wrought	13.75 to 14.00
No. 1 railroad and machinery cast scrap	13.50 to 14.00
Old steel axles	14.50 to 15.25
Old iron axles	17.50 to 18.00
Old car wheels	14.00 to 14.25
Railroad malleable	12.50 to 13.00
Boiler plate	11.00 to 11.25
Locomotive grate bars	11.25 to 11.75
Pipe	10.00 to 10.50
Wrought iron and soft steel turnings	7.00 to 7.50
Clean cast iron borings	6.00 to 6.50
No. 1 busheling scrap	12.00 to 12.25

Construction at the Scotch shipyards in March amounted to 31,912 tons, represented in 22 vessels. For the first quarter of the year the total was 80,822 tons, against 60,084 tons in the same period in 1908, 121,352 tons in 1907, and 128,533 tons in 1906. With the exception of 1908 the total for the March quarter this year is the lowest since 1897.

The Inter Ocean Steel Company, Chicago, has begun active work on the construction of its new plant at Chicago Heights, for the manufacture of locomotive tires and steel wheels. The buildings comprising this notable addition to the industries of that district will be of steel and concrete construction.

Metal Market.

NEW YORK, April 28, 1909.

Copper.—The market has been more active and the first three days of the week started off with a fair run of business. Consumers, both domestic and foreign, bought for nearby requirements and there were some speculative purchases of electrolytic. These were made profitable because of the small difference, in London, between electrolytic and standard. Buying standard and selling electrolytic enabled some to make a small arbitrage profit. The larger producers evince a disposition to hold present prices steady and not allow the market to advance, although the buying is better. Confidence abroad is returning, and it is not unlikely that speculators there would buy largely should the market decline to any extent. Prices are unchanged from last week, lake being nominal at 12.87½c. to 13c. Electrolytic is offered at 12.62½c. and casting grades at 12.50c. The exports to Europe have been large, amounting so far this month to 26,250 tons. Not all of this is going into actual consumption, as some of the metal is being financed abroad. Exports for April will probably amount to 30,000 tons. This should show up well in the report to be issued by the Copper Producers' Association about May 10. The London market closes to-day at £57 5s. for spot and £57 18s. 9d. for futures.

Pig Tin.—The market is dull and lower. The leading consuming interest has the largest stock, and is a more potent influence in the market than is generally considered. Its efforts, apparently, are being directed toward the prevention of violent fluctuations either way. Efforts to advance the market on supposititious tariff considerations have fallen flat, and they are no longer attempted. The general trend of prices during the week has been toward lower levels, as follows:

	Cents.
April 21	29.55
April 22	29.45
April 23	29.55
April 26	29.50
April 27	29.25
April 28	29.25

The arrivals so far this month are 2072 tons, and there are afloat for American ports 2352 tons. The London market closes to-day at £132 10s. for spot and £133 15s. for futures.

Spelter.—The market is very dull, and there are conflicting reports about business. A large interest in Illinois is refusing to quote on spelter, as some of its finished products are moving in such large volume. Some off grades, from second hands, are to be had at 5.02½c., New York. The general market, however, is 5.12½c., New York, for prime Western. In St. Louis 4.95c. to 5c. is asked.

Lead.—The American Smelting & Refining Company continues to quote shipment lead in 50-ton lots at 4.20c. Outside interests are asking all the way from 4.25c. to 4.35c. for spot lead. The edge of the demand, apparently, is off, but lead is not abundant. In St. Louis lead is not as strong as last week. It can be had at 4.15c.

Antimony.—The market is a shade easier than last week. The advance having been brought about by artificial reasons, the decline is really a return to normal. Hallett's can be obtained at 7.75c., Cookson's at 8.25c. to 8.50c. Other brands are to be had at 7.50c. There is still as much likelihood of a higher tariff as before, but its influence as a market factor has ceased.

Tin Plate.—Business is fair. Prices are unchanged in New York at $3.64, and in Pittsburgh $3.45 for 100-lb. IC coke plates. These figures are subject to the usual rebate of 5c. per box on large orders. In Swansea Welsh plates are unchanged at 11s. 7½d.

Old Metals.—There is absolutely no change in the quotations for old metals, but, as repeatedly referred to before, there is a disposition to hoard metals. The following dealers' selling prices represent actual business, although they look high as compared with the quotations for ingot copper:

	Cents.
Copper, heavy cut and crucible	12.25 to 12.50
Copper, heavy and wire	12.00 to 12.25
Copper, light and bottoms	11.00 to 11.25
Brass, heavy	9.00 to 9.25
Brass, light	7.00 to 7.25
Heavy machine composition	11.25 to 11.50
Clean brass turnings	8.00 to 8.25
Composition turnings	9.75 to 10.00
Lead, heavy	3.85 to 3.90
Lead, tea	3.60
Zinc scrap	3.62½

The Carter Iron Company, Pittsburgh, is operating its Monongahela plant at Hays Station at capacity. The puddling department is being operated double turn and the bar mill, guide mill and chain department are running steadily. The company is making large shipments of heavy chains, some of which are made from stock 2¾ in. in. diameter and the links weigh 75 lb. each.

New York.

NEW YORK, April 28, 1909.

Pig Iron.—There has been a very active market both in this territory and in New England, and a number of large sales have been effected. The demand has been somewhat spotty, however, some localities taking a good deal of iron and other nearby cities buying practically nothing. Among the larger transactions being closed is one for 10,000 tons of malleable iron. So far as can be learned, the business of the leading electrical company has not yet been closed, nor has the tonnage required for a large agricultural implement maker, calling for 13,000 tons for one of the plants, been fully covered. The market is decidedly firmer. We quote $16 to $16.50 for No. 1 Northern foundry, $15.50 to $15.75 for No. 2 foundry and $15 to $15.50 for No. 2 plain. Alabama iron is quoted $16 to $16.50 for No. 1 foundry, and $15.75 to $16 for No. 2 foundry.

Steel Rails.—Among contracts reported for the past week are the following: 5000 tons for the Central New England, taken by the Pennsylvania Steel Company; 5000 tons for the Northern Pacific, and 8100 tons for the Chesapeake & Ohio, both open hearth rails, which will be rolled at Gary; and 500 tons each for the Reading and the Buffalo, Rochester & Pittsburgh.

Structural Material.—The tendency appears among structural steel companies to follow the action of the leading interest in making 1.25c., Pittsburgh, the minimum on prompt structural business. The prevalence of this quotation is noted this week, while 1.30c., Pittsburgh, is still being asked on ordinary orders for forward delivery. April has made a record in steel construction contracts, the total now indicated for the American Bridge Company being about 70,000 tons, while all the fabricating companies, it is estimated, have together booked about 200,000 tons. There is a disposition to take a stand for better prices, and in the case of the Missouri Pacific some of the low bids on bridge work have been withdrawn, while the fabricators are not willing to tie up for 18 months, as was desired when this inquiry first came out. Among railroad contracts recently let are 5000 tons for the Cuba Railroad, taken by the Pennsylvania Steel Company, the competition in this case developing prices around 2c.; 2500 tons for the Madeira & Mamoré Railroad in Brazil, taken by the Steel Products Export Company; 600 tons for bridges in Maine on the Grand Trunk, and 300 tons for the Maine Central, which went to the Pennsylvania Steel Company; about 1000 tons for the Central of Georgia, divided between the Pennsylvania Steel Company and the Virginia Bridge Company; 1300 tons for the second Leyland line pier at Boston, going to the Boston Bridge Company; 1400 tons, at Chicago, for the Pennsylvania Lines West, taken by the Riter-Conley Company; 800 tons for the New Haven's train shed at Providence, taken by Lewis F. Shoemaker & Co. In Texas a reinforcement contract is pending for the Pecos River Viaduct, requiring 1000 tons of steel. The Erie contract for its general bridge requirements for the year—5000 to 6000 tons—is expected to be divided among three companies. In New York City the Trinity Corporation warehouse, 2200 tons, and the A. F. Hyde loft building, 2100 tons, have been awarded to Levering & Garrigues; the Hay Foundry & Machine Company has taken the Wills Building on Fifth Avenue, 750 tons, and a considerable number of apartment house contracts has been given out in the recent weeks of low prices. The Forest City Steel & Iron Company, Cleveland, has the contract for the Bailey Realty Company Building—1235 tons. At Schenectady, N. Y., the General Electric Company has placed a contract of 400 tons for a new foundry building. We quote on mill shipments, tidewater delivery, as follows: Beams, channels, angles and zees, 1.46c.; tees, 1.46c. On beams, 18 to 24 in., and angles over 6 in., the extra is 0.10c. Structural material, cut to lengths, is sold in small lots at 1.75c. to 1.90c.

Ferroalloys.—The market for ferromanganese is better. Sales have been made at $41 Baltimore and more. Business is fair, one interest booking over 200 tons on Tuesday. The market for 50 per cent. ferrosilicon is stronger because the largest producers on this continent have been shut down for some time, owing to the ice gorge at Niagara. It is hoped to get these plants in operation shortly. In the meantime any new business for May is up to second hands or continental producers. The price is $60, but this can be shaded.

Bars.—The demand for bar iron has recently shown some improvement, orders being more frequent, while the inquiry is extending to a larger number of buyers. Best refined bar iron is regularly quoted at 1.35c. to 1.40c., tidewater, those who name lower prices either offering a limited range of sizes or not strictly refined iron. Steel bars are in fair demand, with the bulk of the business transacted in this vicinity placed at 1.36c., tidewater.

Cast Iron Pipe.—The current demand appears to be confined to carloads. This locality is still lagging behind other sections of the country, as manufacturers report better business in the West and South. Carload lots of 6-in. continue to be quoted at $23.50, per net ton, tidewater. Niagara Falls, N. Y., will shortly be in the market for about 4000 tons of 16, 24, 30 and 36 in. water pipe.

Old Material.—Old car wheels are in quite good demand, being wanted in considerable quantities for export. The foundry trade is quiet and not much movement is taking place in cast scrap or stove plate. Some inquiry is coming from the steel works for heavy melting steel scrap, but offers made are below the views of sellers. The rolling mill demand shows little improvement, although dealers are making vigorous efforts to excite some interest. It is probable that the sales of the past week were for a smaller aggregate tonnage than in the previous week, but dealers are, nevertheless, more hopeful in their expectations and look forward with considerably more confidence to an early awakening in the consumptive demand. Quotations are as follows, per gross ton, for New York and vicinity:

Old girder and T rails for melting	$11.00 to $11.50
Heavy melting steel scrap	11.00 to 11.50
Relaying rails	19.50 to 20.00
Old iron rails	14.50 to 15.00
Standard hammered iron car axles	15.50 to 16.00
Old steel car axles	15.00 to 15.50
No. 1 railroad wrought	12.50 to 13.00
Iron track scrap	9.50 to 10.00
No. 1 yard wrought, long	12.00 to 12.50
No. 1 yard wrought, short	10.50 to 11.00
Light iron	6.00 to 6.50
Cast borings	5.50 to 6.00
Wrought turnings	6.50 to 7.00
Wrought pipe	8.50 to 9.00
Old car wheels	13.00 to 13.50
No. 1 heavy cast, broken up	12.50 to 13.00
Stove plate	10.00 to 10.50
Locomotive grate bars	9.50 to 10.00
Malleable cast	11.50 to 12.00

The office of Hyde Brothers & Co. of Pittsburgh, who handle railroad and contractors' equipment and supplies, has been removed from 141 Broadway to 50 Church street. They make a specialty of relaying rails.

Iron and Industrial Stocks.

NEW YORK, April 28, 1909.

The course of the stock market since our last report has been without those important changes which accompany the sudden appearance of influential causes. Individual stocks have been affected by special considerations, and in some of these considerable fluctuations have occurred. American Can preferred, for instance, attained its record price on Friday, when it sold up to 80⅜, while the common stock sold at 12, under the stimulus of reports that some change in the company's finances was impending which would involve the payment of at least part of the past due dividends which have accumulated on the preferred. Another security which advanced to a high point was International Harvester common, which reached 83¾, influenced by reports that the early payment of dividends was to be expected. United States Steel common showed decided strength, reaching 54⅛ on Monday, while the preferred touched 115 in the course of the week. The range of prices on active iron and industrial stocks from Thursday of last week to Monday of this week was as follows:

Allis-Chalm., com..	15½- 16¼	Republic, com.....	22⅞- 24⅜
Allis-Chalm., pref..	49⅛- 50⅞	Republic, pref.....	75 - 78
Beth. Steel, com...	23 - 23¾	Sloss, com.....	75 - 76¼
Beth. Steel, pref.....	50	Sloss, pref.....112½	
Can, com.....	10¼- 12	Pipe, com.....	31 - 32
Can, pref.....	78⅞- 80⅜	Pipe, pref.....	74½- 75⅞
Car & Fdry, com..	49⅛- 50⅜	U. S. Steel, com...	51⅞- 54⅛
Car & Fdry, pref.....112		U. S. Steel, pref...114½-115	
Steel Foundries....	37½- 38	Westinghouse Elec.	81½- 83¼
Colorado Fuel.....	38 - 39¾	Chi. Pneu. Tool...	22½- 23
General Electric...158¼-159⅞		Am. Ship, com.....	54½
Gr. N. ore cert....	68¼- 70	Am. Ship, pref.....104½	
Int. Harv., com....	82 - 83¾	Cambria Steel.....	35½- 36¾
Int. Harv., pref...119 -119½		Lake Sup. Corp....	26⅝- 28
Locomotive, com...	54 - 55¾	Warwick	8
Locomotive, pref..114 -115¼		Crucible St., com..	7⅜- 7½
Nat. En. & St.,com.	14 - 14½	Crucible St., pref..	59⅞- 61
Pressed St., com...	37½- 38	Harb.-Walk. Ref., pref..	80
Railway Spr., com.	39¾- 40		

Last transactions up to 1.30 p.m. to-day are reported at the following prices: U. S. Steel common 54⅝, preferred 115¼; bonds 103⅞; Car & Foundry common 50¼, preferred 112; Locomotive common 55¾, preferred 114; Colorado Fuel 39; Pressed Steel common 37¾, preferred 99¼; Railway Spring common 39½; Republic common 24⅜, preferred 79; Sloss-Sheffield common 76¾; Cast Iron Pipe common 31, preferred 74½; Can common 10⅞, preferred 79¾.

The directors of the Dominion Iron & Steel Company, Sydney, Nova Scotia, announce to the stockholders that the larger portion of the $2,750,000 received from the Dominion Coal Company in settlement of litigation has been used to pay off floating debt, leaving the company without debts apart from bonds and current payrolls. It is further announced that 10½ per cent. of the arrears on preferred dividends will be paid on May 10, that half yearly dividends on the preferred stock will be resumed October 1, 1909, and the accumulated dividends on the preferred stock paid as rapidly as the income will permit, also that funds required for exten-

sions and improvements at Sydney will be provided by issuing $2,000,000 of consolidated bonds already authorized.

The report of the Cleveland Cliffs Iron Company, Cleveland, Ohio, owner of Lake Superior iron mines and charcoal blast furnaces, shows for the fiscal year 1907-8 net profits of $1,803,726, against $4,789,712 in the preceding year; charges of $974,911 for depreciation and improvements against $1,210,946; dividends of $982,000 (20 per cent.), the same as for the preceding year, and a deficit of $153,185 against $2,596,766 carried to surplus in the previous year.

Iron and Steel Bonds.

Chisholm & Chapman, 18 Wall street, New York, report the following quotations:

	Bid.	Asked.
Bethlehem Steel 1st ext. 5s, due January, 1926....	81	83¾
Bethlehem Steel purchase money 6s, August, 1998..	115	118¼
Buffalo Iron 5s, October, 1925.....	100	..
Buffalo & Susquehanna Iron 1st 5s, June, 1932....	98¾	..
Buffalo & Susquehanna Iron deb. 5s, January, 1926 ..		99
Dominion Iron & Steel 5s, July, 1929.....	90	92
La Belle Iron Works 1st 6s, December, 1923.....103½		106
Lackawanna Steel 1st 5s, April, 1923.....	93	..
Maryland Steel 1st 5s, February, 1922.....	100	..
Penn Steel 1st 5s, November, 1917.....	100	..
Pennsylvania & Maryland Steel 6s, September, 1925..109¼		110½
Republic Iron & Steel 1st 5s, October, 1934.....	98⅞	100
Sloss Iron & Steel 1st 6s, February, 1920.....105		108
Sloss Iron & Steel consol. 4½s, April, 1918.....	94¾	96
Jones & Laughlin 1st 5s, May, 1939.....	99⅜	99⅝
United States Steel Corporation.		
Collateral Trust 5s, Series A, C, E, April, 1951....114¾		115⅛
Collateral Trust 5s, Series B, D, F, April, 1951....114½		115⅝
Sinking Fund 5s, April, 1963.....103¾		104¼
Union Steel 1st 5s, December, 1952.....104⅜		105
Clairton Steel 5s, 1908-1913.....100		..
St. Clair Furnace 1st 5s, 1910-1939.....100		..
St. Clair Steel 1st 5s, 1908-1926.....100		..
Illinois Steel deb. 5s, January, 1910.....100¼		..
Illinois Steel 5s, April, 1913.....100⅝		101⅛

All bonds quoted "and interest."

A circular relating to the bonds of the Standard Cast Iron Pipe & Foundry Company, Bristol, Pa., of which $500,000 have been issued, says that the property consists of 80 acres of land on the Delaware River adjoining Bristol, Pa., with a river frontage of 2900 ft., and facilities for both rail and water shipments; buildings of steel construction, brick inclosed, with concrete foundations and slate roofs. The capacity is 100,000 tons of pipe a year, apart from special work, and the profit is estimated at $4 a ton. The amount expended for site, buildings, equipment, &c., up to 1908, is put at $798,488; cash on hand, $108,512; proceeds of bonds now issued to be devoted to additional equipment and working capital, $500,000.

Dividends.—The Warwick Iron & Steel Company has declared a semiannual dividend of 3 per cent., payable May 15.

The United States Steel Corporation has declared the regular quarterly dividends of 1¾ per cent. on the preferred stock, payable June 1, and ½ per cent. on the common stock, payable June 30.

Business in Mexico.

DURANGO, MEXICO, April 20, 1909.—A perceptible improvement in the business situation in Mexico has developed since the opening of the present year. Despite the continued low price of silver, mining throughout the country has been actively prosecuted during the first quarter of the year. As a result the volume of business done by the supply houses shows a healthy increase along with a general diffusion of a spirit of optimism in the trading centers. Many important transactions have been made in transfers of mining properties. A renewal of the inflow of capital for investments in this branch of industry, as well as in agriculture, appears to have fairly set in.

The hope, fallacious as it is bound to prove, that the Government of Mexico, or some other indefinite power, will yet "come to the aid of silver" and rehabilitate it in its former position, still exists among a little group in this country. Even the matter of a revival of the discarded free coinage system has been seriously discussed in some of the newspapers. What one journal describes as "an energetic campaign in favor of silver" has been started by members of the Mexican Mining Chamber. A committee has been appointed "to make a special study of the question of the white metal's unfortunate plight," and to present its findings to the Executive Committee. It was also decided when this action was taken to apply to the Government for copies of all the treasury laws, and especially those relating to the taxes imposed on the mining interests.

The inauguration of a "smelter war," which the reported purchase of the Torreon smelter by the International Smelting & Refining Company was by some people expected to signify, has been indefinitely postponed. The Torreon smelter has not been sold, according to a statement made by the president of the company, who declares that neither the Cole-Ryan interests nor the Guggenheims have obtained control of the plant.

Several important industrial enterprises involving large expenditure of capital are in the preliminary stage. On of these is the construction by Canadian capitalists, who already have large investments in similar projects in this country, of a power plant on the Conchas River in the State of Chihuahua, to furnish power for mining and irrigation purposes. The company behind the enterprise is the Mexican Northern Electric Company of Canada, which is said to be prepared to invest $5,000,000 in the scheme. If the project is carried out the mining camp of Parral, where fuel is scarce, and near which the power plant is to be built, will be materially benefited.

In railroad construction operations the activity of the Harriman interests in the prosecution of their plans upon the west coast lines are most notable at the moment. It is announced that the government of the State of Durango has made an arrangement with the National Lines of Mexico and a company interested in timber properties for the early construction of a line of railroad from the capital of the State to a point in the direction of Mazatlan, some 60 miles distant, where the timber is situated. A line to Mazatlan has been "in the air" for 20 years, but it is believed that the present projected piece of track will actually be constructed.

The two companies engaged in the distribution of petroleum have entered upon a lively fight for the Mexican market. The stage of active price cutting has been reached in the capital, and a good deal of interest is manifested in the outcome. At points outside of the federal district the competition of the English company has not as yet been seriously felt by the Waters-Pierce people.

At a recent meeting of delegates, General Porfirio Diaz, President of the Republic, and Señor Ramon Corral, Vice-President, were practically unanimously renominated for another term as President and Vice-President, respectively.

J. J. D.

The New Quebec Bridge.—The plans for the new Quebec bridge will be completed in the next six months, but several years will be required for its construction. It is understood that the original 1800-ft. channel opening will be provided, and that the lowest girder will be 150 ft. above high water. It is now considered unlikely that any of the steel manufactured for the old structure will be used in the new. The structural shapes on the ground will be treated as scrap. The engineers are Maurice Fitzmaurice of the London County Council, Mr. Vautelet, for many years the bridge engineer of the Canadian Pacific, and Ralph Modjeska of Chicago.

A London cablegram refers to the competition in rails which British mills have met in recent months from Canada and the United States in the markets which the British makers have heretofore had to themselves. Among contracts lost by British bidders are mentioned 16,000 tons for New South Wales and 9000 tons for India taken by the Dominion Iron & Steel Company, Sydney, Nova Scotia, and 10,000 tons for New South Wales and 7000 tons for Victoria taken by the United States Steel Corporation.

Contracts have been let and work is to be begun at once upon the erection of a new building, 365 x 1021 ft., at Flint, Mich., to accommodate the works of the General Motors Company, whose Eastern office is in the Terminal Building, 103 Park avenue, corner Forty-first street, New York. Plans for the new works call for the expenditure of about $1,000,000 and the plant, which is to be ready for operation by October 1, will give employment to about 3000 men. It will be located upon a site just outside the city limits near that of the Buick Motor Company.

PERSONAL.

W. E. Corey, president of the United States Steel Corporation, will sail for Europe May 13. He expects to return home on or about the 10th of July.

John Helmuth, who recently withdrew from the late Helmuth Company, has formed a copartnership with Percy J. Murley, under the style of John Helmuth & Co., for the sale of iron and steel, with offices in the Hudson Terminal Building, 30 Church street, New York.

M. L. Fechheimer, former manager of the Eastern branch of the Joseph Joseph Brothers Company, has formed a corporation named the Fechheimer Steel & Iron Company, for buying and selling iron and steel scrap and railroad supplies, with offices in the United States Express Building, 2 Rector street, New York.

W. H. Whiteside, president of the Allis-Chalmers Company, has returned to Milwaukee from a six weeks' tour of the Pacific Coast.

William J. Bird has been appointed assistant to Jos. M. Flannery, general manager of the American Vanadium Company, Pittsburgh, succeeding T. F. V. Curran, resigned.

Harry F. Gordon, formerly credit manager with the Wheeling Corrugating Company, Wheeling, W. Va., has been made advertising manager, succeeding John H. Ewing, who has been made the manager of the mail order department in the St. Louis office of the company.

N. G. Williams, formerly president and manager of the Detroit Twist Drill Company, Detroit, Mich., has severed his connection with the company and has been succeeded as president by H. S. Hodge, formerly vice-president, and by N. W. Snow as manager, who is also treasurer. M. L. Williams, former secretary and treasurer, is now vice-president.

F. C. Mosedale, resident agent for the M. A. Hanna & Co. interests at Buffalo, N. Y., is rapidly recovering from a severe attack of pneumonia, which has kept him confined to his home for nearly three months. He expects to be able to resume his business duties within a few days.

George Gordon Crawford has just arrived from Europe on the Kaiser Wilhelm II, having recovered his strength. He went to Europe in February to recuperate from typhoid fever.

Colomen Méhely, who is secretary of the Hungarian Society of Engineers and Architects, and is connected with the Budapest Ministry of Commerce, is spending the spring and summer months in this country. He is now visiting various technical institutions, and later will visit manufacturers in the interest of the organizations he represents.

H. G. Steelman has been engaged as salesman for the Wilder Metal Coating & Mfg. Company, Connellsville, Pa., manufacturer of aluminum coated sheet steel, and is located at 7 East Thirty-third street, New York.

J. F. Reeves, secretary and treasurer of the Reeves Engineering Company, Mount Vernon, Ohio, has disposed of his interests and retired from the company. J. T. Broughton has been made general manager.

Arthur R. Merkel has been appointed assistant manager of the Columbus Chain Company, Columbus, Ohio, succeeding John Jones, who has engaged in another line of business.

Westinghouse Steam Turbine Orders.—Among the contracts particularly worth mentioning which the Westinghouse Machine Company has lately received is an order from the City Electric Company, San Francisco, Cal., for a 15,000-hp. steam turbine. It will be the most powerful steam turbine installed west of the Mississippi, its power capacity being about equal to 10 of the largest sized express locomotives. This company has already installed three Westinghouse steam turbines of a smaller size. The East Pittsburgh shops of the Westinghouse Company are also turning out at present, on order from the city of Detroit, a 5000-hp. steam turbine, and another of the same size is going to the Nichols Copper Company, Laurel Hill, Long Island, while the Saginaw & Flint Railway Company of Michigan has contracted for an 1150-hp. turbine and the Alaska Treadwell Gold Mining Company of San Francisco has ordered two 1000-hp. machines of the same type. Since April 1 quite a number of orders for steam turbines, steam engines and gas engines have been booked, and the record for the first two weeks of this month shows a considerable increase over the same period of March.

OBITUARY.

PATRICK KEARNS, president of the Stuart & Peterson Company, Philadelphia, Pa., died April 16.

HOWARD D. BARKER, president of the Frank Machinery Company, Buffalo, N. Y., died April 22.

CHARLES E. MCCULLOUGH died at his home in Kewanee, Ill., April 24, aged 59 years. He was formerly treasurer of the Western Tube Company, Kewanee, from which he retired in 1908, when this company was absorbed by the National Tube Company.

NATHAN PRATT TOWNE, chief engineer of the Cramp Ship & Engine Building Company, Philadelphia, and formerly an engineer in the United States Navy, died April 23, aged 65 years. He was a native of Maine. Since 1893 he designed and superintended the construction of the engines of nearly all the battleships, cruisers and large vessels built at the Cramp shipyards.

RALPH SCOTT, Newark, N. J., founder of the Scott Electrical Company, inventor of the Scott arc lamp and author of several books on electric engineering and automatic block signals, died April 27 while being operated upon for appendicitis. Although only 26 years old, he was the holder of 40 patents and was considered an authority on street lighting. He was born in Bradford, England, and was brought to this country by his parents when a child. When stricken with his fatal illness Mr. Scott was engaged in making an arc light that was to have been the largest in the world, for the Lackawanna Railroad terminal at Hoboken. The globe measured 6 ft. in diameter.

EDWARD J. CODD, president of the E. J. Codd Company, machinist and boiler maker, Baltimore, Md., died April 16, aged 76 years. He was a native of Baltimore, and had large interests in financial institutions. He leaves a daughter and six sons. The sons are all prominent in business circles.

Papers for the A. S. M. E. Meeting.

The subjects which will be covered in the professional sessions of the convention of the American Society of Mechanical Engineers to be held in Washington, D. C., May 4-7, include the conveying of materials, gas power engineering, steam turbines, the specific volume of saturated steam, oil well pumping, &c. A list of the papers follows:

"A Unique Belt Conveyor," Ellis C. Soper.
"Automatic Feeders for Handling Material in Bulk," C. Kemble Baldwin.
"A New Transmission Dynamometer," Prof. Wm. H. Kenerson.
"Polishing Metals for Examination with the Microscope," A. Kingsbury.
"Marine Producer Gas Power," C. L. Straub.
"Operating System for a Small Producer Gas Power Plant," C. W. Obert.
"A Method of Improving the Efficiency of Gas Engines," T. E. Butterfield.
"Offsetting Cylinders in Single-Acting Engines," Prof. T. M. Phetteplace.
"Small Steam Turbines," Geo. A. Orrok.
"Oil Well Tests," Edmund M. Ivens.
Safety Valve discussion.
"Specific Volume of Saturated Steam," Prof. C. H. Peabody.
"Some Properties of Steam," Prof. R. C. H. Heck.
"A New Departure in Flexible Stayboits," H. V. Wille.

The entertainment and social features of the programme have already been outlined in these columns.

The National Association of Manufacturers will hold its fourteenth annual convention at the Waldorf-Astoria Hotel, New York, May 17 to 19, in the Astor Gallery.

The Machinery Trade.

NEW YORK, April 28, 1909.

A decidedly better feeling prevails among machinery houses and merchants talk more encouragingly as to the prospects for a more active demand in the near future. While it is true that there has only been a slight betterment and trade is still far from normal, such increase in the volumes of sales as has developed has on the whole been maintained, and this with the apparent improvement in general conditions has created the impression that the upward movement has started. The greater number of inquiries received and their larger size have also given trade an upward tendency. So far extensive orders and inquiries have been rather scarce and merchants have had to rely, to a great extent, on scattered business, but now some of the important interests are contemplating coming into the market for large quantities of machinery in the near future. It is not so much the actual business being transacted, but the reports of improvement in business with companies using metal working machinery and the more interest they are taking in their future mechanical requirements that are creating the optimism. In preparation for the increased demand that is felt is coming shortly some machine tool dealers are increasing their stocks. Business the past week has held up fairly well, but no large inquiries or orders are reported. Steam specialty houses report a much better demand the past two weeks.

The American Locomotive Company has inquiries in the market for the traveling cranes it will require for the new boiler shop it is to erect at the Brooks plant at Dunkirk, N. Y. For this shop, which will be about the same size as the foundry, 175 x 650 ft., a large amount of mechanical equipment will be required, but it is understood that no inquiries have as yet been sent out for equipment other than the cranes. It is likely that within a short time the company will be ready to receive bids on the complete boiler shop equipment. Merchants in the trade are closely following the American Locomotive Company, as it is thought that in the near future it will come into the market for a large amount of machinery. Its business is gradually improving, and should the betterment be maintained it is probable that the company will again take up in the immediate future the purchase of about $250,000 worth of machinery which it had under consideration the latter part of 1908. At the time it was reported that a list covering that large amount of machinery had been prepared, and since that time it has been held in abeyance. This equipment is to be installed in the various plants of the company and will be purchased as soon as business shall warrant. In this connection it will be of interest to note that another leading locomotive builder has had under consideration for some time the purchase of a great deal of additional equipment.

The bids on the extensive list of machinery which the Delaware, Lackawanna & Western Railroad issued some time ago have been forwarded from the purchasing agent's office to the mechanical engineers at Scranton, Pa., where most of the machinery is to be installed. The officials there are now going over the list and, notwithstanding the fact that the company has intimated that it may not place the orders for several months, it is said that the mechanical department has designated at least some of the equipment which will be useful in Scranton if delivered at an earlier date.

The Lehigh Valley Railroad has purchased a large air compressor from the Chicago Pneumatic Tool Company, New York, for its shops at South Easton, Pa. The purchase of air compressors and similar equipment by railroads is of considerable interest to the trade, in view of the fact that such purchases are often followed by inquiries for machine tool equipment. It will be remembered that the Lehigh Valley Railroad has prepared a good sized list of machine tools it intends to purchase for its shops at Sayre, Pa., but this list has not yet been issued. It is hoped, however, that the road will shortly ask for bids on this equipment.

The Max Ams Machine Company, New York, is to build a $22,000 addition to its plant at Mt. Vernon, N. Y., which is devoted to the manufacture of canning machinery. The new building will be 24 x 115 ft., four stories high, of brick construction, and will be erected at the west end of the present plant. The general offices, which are now in the east end of the plant, will be located in the addition, as will also a showroom and drafting room, the remainder of the space to be used for manufacturing. Construction work is to be started as soon as possible, and it is expected that the new building will be ready for occupancy within two or three months.

The York Motor Car Company, York, Pa., has been buying considerable machine tool equipment in this territory of late and within the last two weeks finished up on a rather extensive list of requirements. The total purchases aggregated in the neighborhood of $10,000, and consisted of a general line of machine tools and other equipment for the manufacture of automobiles.

L. F. Grammes & Sons, Allentown, Pa., intend to install a new plant for the manufacture of machinery and supplies and desire the names and locations of up to date factory buildings in the East, which they can visit in search of desirable features.

The Automatic Transportation Company, Buffalo, N. Y., manufacturer of aerial railway material for rural and mining district lines for transporting light freight and express matter, has let a contract for an additional factory building at its plant, Main street and the Erie Railroad. It will be two stories, of brick, 50 x 150 ft., and will be equipped as an iron machine shop.

A large deal has been closed at Syracuse, N. Y., through which the Crouse-Hinds Company, at present occupying four buildings on Walton street and a five-story building on Jefferson street, has purchased a site 500 x 1500 ft. on Seventh, North and Wolf streets, on which it will erect a large manufacturing plant, plans for which are now being prepared by Architects and Engineers Gaggin & Gaggin, University Block. Five buildings are to be erected at once on the new site. In four of these buildings are to be manufactured all the electrical appliances of which the Crouse-Hinds Company makes a specialty, including panel boards, switchboards, switches and conduits. The other building is to be devoted to the manufacture of the Hawley time registers, which the Crouse-Hinds Company owns. The company was incorporated in November, 1903, by Huntington B. Crouse, Jesse L. Hinds and David F. Costello, with a capital stock of $450,000. Preliminary work only has been done so far on the plans for the new plant, and it will be some time before the company is ready for bids on machinery and construction.

A. E. Trachsel, who is well known in the export trade and who has had experience in that line, and is particularly well acquainted with trade in the Central and South American countries, has opened offices at 45 Broadway. He desires to make connections with American manufacturers, particularly in the machinery and supply lines.

R. M. Jones, chief engineer of the Rocky Mountain Hydro-Electric Company and president of R. M. Jones & Co., hydraulic and electrical engineers, Denver, Colo., is spending a short time in New York and is visiting friends in the machinery trade here.

It is likely that the Sicilian Asphalt Company, 41 Park row, New York, will require considerable power equipment and other machinery for a large asphalt refinery which is to be erected on the property the company recently purchased at Elm Park, S. I. Plans have been filed with the Bureau of Buildings for a three-story brick building, the estimated cost of which will be $40,000.

The Columbia Power, Light & Railway Company, Bloomsburg, Pa., will shortly purchase material for the building of a 25-mile 23,000-volt transmission line, about 2000 kw. of power transformers, lightning arresters, &c., and will also install a 500-hp. hydraulic turbine, 300-kw. generator and a 200-kw. generator, switchboard, &c. The company will purchase the material and do its own construction.

The Spooner-Matthewson Company, New York, representative of the Ridgway Dynamo & Engine Company, has received an order from the Gould Storage Battery Company for a large booster set and exciter set to be installed for the Detroit River Tunnel Company. These machines will be used in connection with the storage battery plant operating the trains of the Michigan Central Railroad under the Detroit River. The storage batteries are being installed to equalize the loads on the power plant, charging when the traffic is light and discharging when it is heavy, and maintaining a practically constant load on the main generating plant. This system makes it possible to carry with a comparatively small plant the extreme loads occasioned by several trains running at the same time. The peak loads will be very heavy, and the booster will, therefore, be required to handle extremely heavy overloads for short intervals.

Chicago Machinery Market.

CHICAGO, ILL., April 27, 1909.

The general quietness prevailing in the machinery market is unrelieved by any notable acceleration of movement, but there is on all sides evidence of gradual but slow expansion. There are a few new plants being built in various parts of the country, the majority, however, being of unimportant size, and the equipment for these together with indispensable replacements, and additions in existing plants, combine to furnish a volume of business that on the whole is considerably larger than was being entered a year ago. If to the demand now coming from other sources were added purchases relatively as great by the railroads and allied manufacturing interests whose activities are dependent upon them, the situation would be quickly brought to a more nearly normal basis. As it is, the railroads are almost a negli-

gible factor in the machinery market; nor is it likely that they will buy any more freely than they are now doing prior to July 1, at least. The closest possible retrenchment of expenditures in every department for the remainder of the fiscal year, which with most roads ends July 1, will probably be practiced. This was noticeably the case last year, and similar conditions at this time will in all likelihood be productive of the same results. About the only industry in metal working lines operating full time and capacity is that of automobile building. A good many of these plants are working night and day, as are also some of the factories making automobile parts and accessories.

The Commercial Motor Car & Engine Company, Chicago, successor to the Western Engine Works, manufacturer of special machinery and engines, has filed application for an increase of capital stock from $20,000 to $100,000. A new addition, 60 x 123 ft., doubling the size of the present factory, is now under construction, and will be equipped throughout with new machinery suitable for the manufacture of a patent direct drive friction transmission for automobile trucks and air cooling engines. Among the recent orders received is one for 200 two cylinder air cooling motors from a leading automobile interest.

The La Crosse Hay Tool Company, Ottumwa, Iowa, manufacturer of hay tools and farming implements, has closed a contract with the Chicago Heights Land Association for a tract of land at Chicago Heights consisting of 15 acres, upon which it will erect a new plant. Track connections for switching service will be arranged with the different railroads running through the city. The buildings, for which plans and specifications are now being prepared, will include two buildings 80 x 550 ft., one of which will be three stories and basement and the other one story high, in addition to which there will be an office and smaller buildings all of brick, steel and concrete construction. The plant, which is expected to be ready for operation by October 1, will give employment to 400 men when running full capacity. As the plant will be fully double the size of the present one, it will necessitate the purchase of considerable new equipment. A. Hirschheimer is president.

A contract has been awarded to the Vinton Construction Company, Detroit, Mich., for the construction of an addition to the factory of the Weston-Mott Company, Flint, Mich., maker of automobile parts. The new building will be 165 x 304 ft., a part of which will be two stories and a portion covered by a saw tooth roof. The erector's contract includes heating, pumping, painting, sewerage and sprinkling equipment. Orders are now being placed for the additional machinery required.

The capacity of the Norfolk Electric Light & Power Company, Norfolk, Neb., is being enlarged by the installation of a 200-kw. steam turbine set fitted with condenser. This will call for greater steam generative capacity, to supply which a high pressure turbine boiler will probably be required, together with some outside line improvements. The turbine set and condenser have already been purchased.

Cleveland Machinery Market.

CLEVELAND, OHIO, April 27, 1909.

The local machine tool market shows practically no change. The business of dealers is restricted mostly to orders for single tools, and no new inquiries of any size have developed during the past week. Merchants are depending on the makers of automobiles and allied industries for practically all the business they are getting. With builders of machine tools and general machinery the outlook is somewhat better. Orders are more plentiful and are coming from a more varied line of industries. Many of these orders are for special tools. While not much business is coming from the railroads the demand from this source has improved slightly with some of the manufacturers. Structural shops in this territory are now quite busy, but this activity has not yet resulted in much improvement in the demand for fabricating tools. There is a fair improvement in the demand for heavy handling machinery for various industrial plants and mill machinery, and some good orders were booked during the week. Engineering concerns are figuring on considerable work in the way of new plants and additions in metal working lines, but in most cases these projects are slow in coming to a head.

In the foundry trade conditions remain about stationary. Jobbing foundries making light gray castings have a fair volume of work on hand, but there is not much demand for heavy iron castings and not much improvement in orders for steel castings.

To provide funds for the improvements proposed by the Wheeling & Lake Erie Railroad the federal court in Cleveland has authorized the sale of receivers' certificates to the amount of $1,429,976. Of this sum $750,000 will be used in the erection of new shops at Brewster, Ohio, work on which will be commenced as soon as the money is available. The company is planning to concentrate eventually practically all its shops at Brewster, and the construction work that will be started soon will be planned with that idea in view. The principal construction the present season will be a locomotive repair shop and a round house. The repair shop will be planned with the view of adding to it later and doubling its capacity. Plans are now being prepared and the company expects to be in the market soon for its machinery and power requirements. Of the proceeds of the receivers' certificates nearly $700,000 will be used in general repairs and betterments. Among these items will be the expenditure of about $40,000 for the repair of the ore docks at Huron, Ohio.

The Cleveland office of the Waterbury Farrel Foundry & Machine Company has received an order from the Buffalo Copper & Brass Rolling Mill, Buffalo, N. Y., for the entire rolling mill machinery for a new brass mill.

The Ohio Forge Company, Cleveland, is building a new machine shop in connection with its plant and will purchase a number of machine tools. The company has just increased its capitalization from $10,000 to $100,000, and may decide to rebuild its forge plant and enlarge its capacity.

The Johnson-Adams Switch Device Company, Columbus, has been incorporated with a capitalization of $100,000, to manufacture a patent device for street cars. The officers are: S. A. Johnson, president; J. A. Kidwell, vice-president; C. B. Adams, secretary and treasurer.

The Interstate Engineering Company, Bedford, Ohio, closed orders the past week for over 2500 tons of structural steel work. The bulk of this tonnage was for new buildings for the B. F. Goodrich Company, Akron; Northern Ohio Traction & Light Company, and the Enameled Pipe & Engineering Company, Elyria, Ohio. The company also shipped a crane to the Mare Island Navy Yard.

Philadelphia Machinery Market.

PHILADELPHIA, PA., April 27, 1909.

Transactions continue on a fairly even basis, the slight gains recently made being maintained and the buying during the week having been of a somewhat broader nature. Several merchants report increased sales of tools of a somewhat larger size, while the quantities taken are better. Several sales are reported where three or four tools for extension to buyer's present equipment have been taken by single purchasers. Inquiries are also reported as being more plentiful and of a character which lead up to business more promptly than heretofore. Several propositions of a more pretentious nature are being considered, and the trade generally feels more encouraged over the prospect. That it will take some time for conditions to reach anything like normal is unquestioned, as the larger industrial plants gain but slowly, and until business in general becomes more active the machinery field will scarcely experience any material betterment. An agreement with the anthracite coal miners is expected during the week, which should help the situation in the coal fields, where business has been held back pending an adjustment of the question.

From the manufacturers' standpoint improvement comes but slowly. A trifle more business has been coming to the tool builders, but orders are irregular, and increases in production, particularly in the larger plants, are small. Textile machinery plants and the smaller special tool makers have taken on quite a fair volume of business and are generally busy. Automobile builders are very active and have been quite extensive buyers of equipment of a general nature.

The foreign trade shows but little improvement; there has been some inquiry for special equipment, but for tools of the standard classes the demand has been practically nil. Makers of specialties report a fair run of orders, which are usually small individually.

Second-hand machinery continues in comparatively good demand; business is irregular, however, and largely of a day to day character. The demand for second-hand engines and boilers is fair, particularly for equipment of the smaller horse powers. Some good propositions in the way of new equipment of the larger powers are under consideration, with very satisfactory business in sight.

The foundry trade is a trifle more active; general orders are reported more numerous, but the tonnage production has not increased very heavily. Steel casting plants show but little gain, although gray iron plants producing castings for textile machinery are fairly busy. The demand for castings for machine tools in general still drags.

The American Rubber Reclaiming Company has let a contract to erect a three-story factory building at 402-404-406-408 Rittenhouse street, Germantown, which it will occupy for manufacturing purposes as soon as completed.

The Ballard Knitting Company, Norristown, Pa., is securing estimates for a five-story and basement factory building, 50 x 154 ft., to be erected in that city. The building will be largely of concrete.

The Department of Wharves, Docks and Ferries, Philadelphia, will receive bids until May 6 for all appliances, material, tools and labor necessary for repairs constituting practically the rebuilding of the Arch street pier on the Delaware River. Specifications can be obtained on application at the office of the director, room 348 Bourse Building.

The William Steel & Sons Company has been awarded a contract to build a three-story garage, 40 x 140 ft., on Broad street above Fitzwater, for the Bailey, Banks & Biddle Company. It will be equipped with the necessary tools and appliances to care for the company's automobile delivery service.

Ivins, Dietz & Magee, manufacturers of carpets, are having plans prepared by Ballinger & Perrot, architects and engineers, for a new factory building to be erected at the northeast corner of Seventh and Huntington streets, details regarding which are not yet available.

The Hoopes & Townsend Company has purchased a factory building at the northwest corner of Twelfth and Noble streets from the National Umbrella Company. The building is three stories and measures 150 x 176 ft. on the ground plan. Alterations to make the structure suitable for storehouse and shipping purposes will be made.

The Frankford Arsenal, Philadelphia, will receive bids until May 26 for supplies for the year ending June 30, 1910. These include steel and iron, copper tubing, tin, zinc, lead, antimony, castings, electrical supplies, belting, plumbing and steam fitting supplies, tools and miscellaneous articles. Information regarding specifications may be had on application to the commanding officer.

The Philadelphia Roll & Machine Works has closed a contract for the erection of a new roll and machine shop. The building will be 60 x 120 ft., with a lean-to on each side of the building. Four additional large roll lathes for installation in the new building are now under construction, and these, as well as other portions of the shop, will be served by a 30-ton electric traveling crane. When the new addition is completed the output of the company will be materially increased. It will then have a separate foundry, 328 ft. long by 50 ft. wide, served by two electric traveling cranes, and with the three air furnaces and other contemplated improvements it will be enabled to take care of increased business in chilled and sand rolls and charcoal air furnace iron castings, for which the company has a large demand.

New England Machinery Market.

BOSTON, MASS., April 27, 1909.

The improvement in general business conditions in the New England territory continues without abatement, but with no indications of rapid acceleration. May promises to be the best month of the year, as it usually is. In the machine tool trade April has been somewhat disappointing in its totals, especially among the dealers, yet business is a great deal better than it was a year ago. One machinery house has practically seven times as much business in the first quarter of the year as in the corresponding period of 1908. The machine tool builders are gaining ground, though as a rule the progress is slight, excepting where the automobile trade is the buyer. This factor is playing a part of undiminished importance in the machinery market. It could not well be otherwise, for the automobile builders are planning for a production this season from 33 1-3 to 50 per cent. greater than last year. The two great lines which do not share in this business are the planers and standard lathes. Few planers are required in the industry, and lathe work is done on the more special machines. During the flush days of the bicycle the planers alone were the marked exception, lathes being used to a large extent. Now the lathes have lost their usefulness in the corresponding period of the automobile.

The builders of blower and exhaust systems report an improvement in business. The chief demand comes from the woodworking plants, with New England as the most important buyer among the Eastern States.

One of the important machinery houses of the Middle West is endeavoring to induce the National Supply and Machinery Dealers' Association to take further action in the matter of territorial rights, and the association has reproduced a letter on the subject and distributed it among the members, reading as follows:

I would like our association to take up the question of a "dealers' agreement." This should be some form of agreement to be used between dealers handling kindred lines. Our association has spent considerable time compiling an agreement which is used between the manufacturer and the dealer, and the use of which I believe has met with more or less success, but I believe would be more generally used if the dealers were to show a more liberal and fair disposition toward each other. I regret that there is a disposition among some dealers, while professing the greatest friendship for each other, to go into each other's territory, offer machines that they have no right to sell, quote prices, and in other ways harass the dealer in whose territory they seek for business. I do not think that it is the deliberate intent or purpose of any dealer to do this, but nevertheless it is done. I believe an agreement could be compiled that we could use among ourselves, which would establish a record of the territorial lines, provide for cases where one dealer could quote or ship in the territory of the other, and other matters that would bring about a still closer relationship among the dealers than now exists. Over-zealous salesmen often do things that are excused by their not having a thorough understanding of selling arrangements. With an agreement such as I have in mind there would be no excuse for such mistakes.

The Greuter Auto Company, Saugus, Mass., has established works in the Scott Mills buildings, and will manufacture automobiles. The car will be of standard type, but will contain a number of improvements in details. The company has purchased some equipment, sufficient to proceed with the building of the model cars, and plans to increase its facilities considerably later.

The Chernade Circular Loom Company, 262 Dover street, Boston, is making tentative inquiries for machine tools, with the purpose of establishing a machine shop for the manufacture of textile machinery. The office of the company is at 620-621 Tremont Building, Boston.

The Ashton Valve Company is about to move from Boston to its new works on First street, East Cambridge, Mass. The company states that it will buy no equipment immediately; probably it will not be necessary to enter the market for six months, and then machinery will be added from time to time. The main building of the plant is 50 x 200 ft., and three stories; the foundry is about 30 x 60 ft., and there is a complete power plant.

The business of E. F. Smith & Sons, Union City, Naugatuck, Conn., has been incorporated under Connecticut laws as E. F. Smith & Son, Inc. The company will manufacture sheet metal and wire specialties, as well as ivory buttons. The capital stock is $50,000, and the incorporators Edwin F. Smith, Frank A. Smith and Harriet S. Smith.

The General Mfg. Company, Waterbury, Conn., is a new Connecticut corporation with capital stock of $10,000, organized to manufacture rivets, screws, studs and kindred products. The factory has been located at 66 North Elm street. The incorporators are John Draher, Max Keisling and Charles F. Probst, all of Waterbury.

Improvements planned for this year by the Boston & Albany Railroad include a new electric lighting plant at East Boston and improved fire protection for the company's property in that part of the city.

The George M. Griswold Machine Company, New Haven, Conn., is removing its plant from 35 Union street to the building on Bradley street formerly occupied by the National Folding Box Company. The new factory gives the company considerably more manufacturing space, and the plan is to increase the business.

The North & Pfeiffer Mfg. Company, New Britain, Conn., is to establish a department of die making for manufacturers of light hardware.

The Cushman Chuck Company, Hartford, Conn., has taken a long lease of a building on Ann street, that city, and will occupy it as an addition to its plant. The offices will be located there, and the shipping department will be moved from the present shops, which will be continued as formerly, but with increased manufacturing space, owing to the relief afforded by the new building. The newly acquired structure has four stories and basement, and contains about 15,000 sq. ft. of floor space. It is of heavy mill construction, equipped with elevator, and is admirably adapted in every way for the company's purpose. In addition to the uses already mentioned there will be room for manufacturing.

The American Oil Engine Company has been organized under Maine laws to take over the business of the International Oil Engine Company, Danielson, Conn. The company has an authorized capital stock of $500,000. W. P. Hatch, its president, who has been associated with the business for a long time, states that the new company has purchased all the property of the old, with the exception of the real estate, and will remove the entire plant to another location, arrangements for which have not been completed. The present office is at 1779 Broadway, New York. The company manufactures stationary, marine and automobile oil engines.

The E. H. Hotchkiss Company, Norwalk, Conn., manufacturer of metal novelties, will rebuild the factory recently partially destroyed by fire, the plan being to create larger quarters.

The Marine Railways & Construction Company, Stamford, Conn., is erecting a new boat building and repair plant at Waterside in that town, and is in the market for a steam hoist of 18 to 20 hp. equipped with 1½-in. wire cable, and with a 4-ft. drum. A main building will be 50 x 100 ft., and there will also be a large storage building and a set of ways to handle vessels to 300 tons.

The Connecticut Mill Supply Company, Torrington, Conn., has reincorporated under the laws of Connecticut, and will give up its New Jersey charter. J. R. Coe is president, G. H. Braman treasurer and F. E. Norcross superintendent. The company manufactures textile specialties, pressed steel spinning rings being the present product, and is developing a line of pressed steel bobbins and spindles in part, and will proceed with the manufacture of textile mill machinery on the line of cheaper and better product by introducing pressed steel wherever possible.

The activity in the textile mills in respect to new build-

ing continues, announcements of important extensions following one another in rapid succession. The Independent Cotton Mills, Manville, R. I., will erect a mill in that place, with a capacity of 1000 looms, which means a power plant of considerable size. The Glenlyon Bleachery, Pawtucket, R. I., will build an addition to its mills at Phillipsdale, to cost $85,000. The Naumkeag Steam Mills, Salem, Mass., will put up a large weave shed. The Everett Mills, Lawrence, Mass., is making important enlargements, and the Pacific Mills of the same city is building considerable additions, as well as developing a new mill property recently purchased at Cocheco. It is stated that the new Reciprocity Mills, a project which Eugene N. Foss, of the B. F. Sturtevant Company, is carrying through, is practically financed, which will mean the expenditure of $1,000,000 at East Boston. The Dartmouth Mfg. Company and the Pirce Mfg. Company, New Bedford, Mass., will each add some 50,000 spindles this season. In Fall River the proposed enlargements include those of the American Linen Company, Arkwright Mills, Borden City Mills, Davis Mills, Estes Mills, Hargrave Mills and Sagamore Mfg. Company.

Milwaukee Machinery Market.

MILWAUKEE, WIS., April 27, 1909.

Business conditions here seem to be settling down at last to a definite trend upward; trade in the various industries is taking on a less spotted character, and more orders for machinery have, within the past week or two, covered full lines of equipment. This is, to a considerable extent, necessitated by the stage reached in building operations. New shops and additions to existing plants are taking shape in all parts of the State, and for nearly all of these extensions apparatus in great variety needs to be purchased. The same is true of industries in States lying to the north and west, which have always been the largest and most dependable customers of many Wisconsin manufacturers, and from the inland and Pacific Coast districts a steady influx of orders is assuming considerable proportions. Were the situation here influenced only by Northwestern trade, it would, therefore, be very favorably affected, but the improvement is less apparent in business received from the country at large. This, too, is helped out, at the present juncture, by shipments made on contracts taken about the first of the year, when manufacturers in Wisconsin, and particularly the larger concerns at Milwaukee, had quite a heavy run of orders that did much to keep the shops in operation. These sales are now being realized upon, and there seems to be no difficulty in making collections promptly. Many bills are, in fact, being discounted.

Another feature of significance is the fact that manufacturers having in hand sufficient funds to carry the account are now working on orders for stock—in some cases of very costly machinery—believing that within the next few months there will be a demand for all they can supply for practically immediate shipment. Even at the present time the greater number of contracts taken specify 30 days' delivery or less; and the tendency is, when once an improvement has been decided upon, to rush it to completion. Those in a position to make prompt shipments have, accordingly, a material advantage over their competitors.

The Cutler-Hammer Mfg. Company, Milwaukee, has prepared plans for an extension, 60 x 150 ft., three stories, to its plant on Thirteenth street and St. Paul avenue. The new lines of manufacture recently entered upon will, in the near future, require much additional machinery and probably a further increase in capacity before the year is out.

Owing to what are deemed exorbitant rates paid for city water, the Kissel Motor Car Company, Hartford, Wis., may establish its own pumping plant.

It is reported from Lena, Wis., that the Thor & Kabat Gas Engine Company, Manitowoc, is considering establishing a plant there.

The Commodor Iron Mining Company, Virginia, Minn., will install an electric generating unit for direct current to be used for power and lighting.

The Mandt Wagon Company, Stoughton, Wis., is redesigning the arrangement of its works to provide for replacing belts with motor drive. This is independent of the new foundry.

Plans for the new plant of the Wisconsin Carriage Company, Janesville, are nearly completed. They include electric motors for operating the machinery.

Bids are being taken on structural steel for the plant of the Marathon Paper Mills Company, Wausau, Wis. Contract covering the power and electrical machinery has been let to the Allis-Chalmers Company, West Allis, Wis.

The Oregon Light & Power Company has been incorporated at Portland, Ore., with $2,000,000 capital stock, to develop power for transmission to Portland from a hydro-electric station on Eagle Creek.

An electric generating unit of 150-kw. capacity has been installed by the Luverne Brick & Tile Company, Luverne, Minn., and some additional machinery is likely to be bought this summer.

It is reported here that the Northern Pacific Railroad is planning to build new ore docks along the harbor front at Superior, Wis., and to operate the machinery by current supplied from the mains of the Great Northern Power Company, which has a cable under the bay connecting with the sub-station on the Duluth shore.

The Twin City Iron & Wire Works, St. Paul, Minn., has moved to a larger plant and will considerably increase its present facilities. Additional equipment is likely to be gradually installed as the business warrants.

F. X. Fryder, Iowa City, Ia., is interested in a new construction material plant to be built at Kalona, Ia.

A correspondent at Erie, Pa., states that the T. M. Nagle Engine & Boiler Company will contract shortly for the equipment of a new machine shop 180 x 500 ft.

Advices from Fresno, Cal., state that the Sierra Park Power Company, incorporated for $100,000, will build a hydro-electric plant on the Joaquin River. C. K. Kirby is the moving spirit in the enterprise.

The new electrically operated plant of the Davis Mfg. Company, Milwaukee, builder of gasoline engines, is nearly ready for occupancy. Practically all of the equipment required has been purchased.

The Knox Engineering Company, Chicago, has established a branch in Wisconsin, R. M. Hackett, Wausau, being State representative.

William A. Whitney, Superior, Wis., is reported to be planning the erection of a plant for the manufacture of construction material.

Two electric generating units of 750 kw. capacity and machine tools for repair work will be purchased by the Prosser, Wash., Power Company, if plans at present reported are consummated.

The Baumberger-Tibesar Company, Eau Claire, Wis., succeeds the McAnulty & Baumberger Company as designing and constructing engineer.

Machine shops for the manufacture of gasoline engines will be built at Lewiston, Mont., by L. W. Spaulding, a non-resident, if satisfactory arrangements can be made.

Cincinnati Machinery Market.

CINCINNATI, OHIO, April 27, 1909.

Business in the machinery and machine tool lines is regarded by the larger producers in this market as on the mend, but slowly; and this opinion is formulated more from the character of inquiries and tone of correspondence than from the actual volume of business placed. The automobile concerns, as has been the case for some time, are the greatest factors in existing trade in the tool line, some of the tool manufacturers giving up a part of their establishments and forces to the making of automobile parts, such as steering gears and other important divisions of auto mechanism. The local dealers note a better inquiry, and some fairly good sales of special machinery. Large tool establishments are gradually replacing men in various departments and some are making up stock, believing that the buying movement so long delayed cannot be much longer postponed.

Local machine tool establishments have, as a rule, utilized the months of depression in making needed improvements, such as were needed during the high pressure trade of the greater part of 1907, but were impossible then owing to the importunities of those who demanded machines for the earliest possible delivery, which was in many cases six and nine months, and even a year. Concerns manufacturing three and four distinct types of tools, of which there are several in this market, have perfected arrangements for the economical assembling and building of these tools. These same concerns have been busy, too, with plans and specifications on patterns for improvements of their lines, and as a result a number of important announcements are due ere mid-summer. Among them may be mentioned the R. K. Le Blond Machine Tool Company, Cincinnati Bickford Tool Company, Cincinnati Planer Company, Bradford Machine Tool Company, United States Electrical Tool Company, Cincinnati Electrical Tool Company, Steptoe Shaper Company, and others.

Second-hand tools are receiving only moderate attention. Foundries are increasing their melts slowly, those having a trade in miscellaneous castings showing the most marked improvement.

Treasurer Frank A. Huber of the Marion, Ohio, Steam Shovel Company has announced that his company is preparing to increase its facilities this summer and will build a handsome new office building.

The International Steel & Iron Construction Company, Evansville, Ind., reports a gradual improvement in business and the utilization of its drafting staff in making plans and specifications for early building improvements. The company recently secured the contract for the erection of the Schaum Building, at Campbellsburg, Ind.; 10 complete store fronts

of steel construction, W. S. Chapman, Bitts, Ga., and others for Rockport, Ind.; Cloverport, Ky.; Princeton, Ind., and Portheeville, Mo.

The citizens of Delphos, Ohio, have voted for bonds in the sum of $40,000, about half of which amount will be sold at once to purchase ground in the residence portion for the extension of the plant of the Delphos Mfg. Company, maker of galvanized sheets, eaves trough, conductor pipe, oil cans, tanks, &c. As soon as the deeds can be obtained the company will begin the erection of buildings for the manufacture of galvanized tubs and pails, granite ware and tin ware. Ground has been broken for the company's new $15,000 office building, which it expects to occupy about August 1. The new addition to the galvanizing plant will be 60 x 160 ft.

Information received here indicates that the $50,000 list of tools for the Carolina, Clinchfield & Ohio Railroad, which has been out for several months, has been awarded, but details of the successful bidding are not received. It is stated that the award was made through New York connections.

Preparations for the erection of a reinforced concrete building, 103 x 300 ft., for the American Steel Dredge Company, at Ft. Wayne, Ind., have been commenced, and the work is expected to be completed by July 1.

Columbus, Ohio, is likely to have a fine power building if the plans of a prominent banker of that city succeed. Options have been taken and plans are being prepared for a building to cover the entire space of 80 x 150 ft. and from six to eight stories in hight. It will be of heavy mill construction, and will have a power plant in the basement.

The Brown Steel Barrel Company, Toledo, Ohio, will build a factory at Earl street and Lake Shore tracks for the manufacture of a new steel barrel, which in appearance is not unlike the wood barrels in extensive use. The first structure will be 40 x 200 ft., and the plant will be increased and enlarged as business warrants.

Articles of incorporation of the Inland Steel Casting Company, Terre Haute, Ind., have been filed and the company will proceed at once to erect a factory, 100 x 250 ft., in North Nineteenth street, near the works of the Terre Haute Malleable Iron Works. The concern will manufacture all kinds of hardware and iron goods. President Smith of the Allith Mfg. Company, Chicago, is the principal stockholder in the new corporation.

The deal in which an option on the works and property of the Platt Iron Works Company, Dayton, Ohio, has been held for some time is said to be maturing this week in New York. President George D. Crabbs of the Philip Carey Mfg. Company, Cincinnati, is at present in New York and, together with capitalists of that city, working out the details.

The Standard Pattern & Mfg. Company, Richmond, Ind., has moved from its location at Eleventh and North E streets to the building in that city formerly occupied by the Richmond Mfg. Company near the Panhandle station. The company will increase its capacity and add several employees. Gasoline engines and compressors will be added to the line.

The Pilliod Company, Swanton, Ohio, has been incorporated with a capital stock of $100,000 to manufacture valve gears for locomotives. The incorporators are Frederick E. Pilliod, John W. Crisman, Abner D. Baker, George P. Hahn and Sigmund Sanger.

Government Purchases.

WASHINGTON, D. C., April 27, 1909.

The Isthmian Canal Commission will receive bids until May 4, Circular No. 506A, for duplex pump, cast iron pipe and fittings and other supplies.

The Isthmian Canal Commission will receive bids until April 30 for a locomotive crane for the Porto Bello quarry.

The following bids were opened April 20 for machinery for the navy yards:

Class 1.—Two screw cutting extension gap lathes—Bidder 44, Harron, Ricard & McCone, San Francisco, Cal., $831 and $792; 52, R. K. Le Blond Machine Tool Company, Cincinnati, Ohio, $630.10 and $1218.10; 84, Prentiss Tool & Supply Company, New York, $915 and $875; 118, Tucker Tool & Machine Company, New York, $1350, $1842 and $1760; 122, Vermilye & Power, New York, $1720.

Class 2.—Two drill presses—Bidder 44, Harron, Ricard & McCone, San Francisco, Cal., $211, $170 and $108.50; 45, Henshaw, Bulkley & Co., San Francisco, Cal., $140.

Class 21.—Four 30-kw. turbo-generator sets and two sets of spare parts—Bidder 15, E. W. Bliss Company, Brooklyn, N. Y., $12,250; 36, General Electric Company, Schenectady, N. Y., $9300; 114, Terry Steam Turbine Company, New York, $9990.

Class 31.—Four 300-kw. turbo-generator sets—Bidder 15, E. W. Bliss Company, Brooklyn, N. Y., $7100; 36, General Electric Company, Schenectady, N. Y., $11,675; 114, Terry Steam Turbine Company, New York, $10,375.

Class 31.—One No. 2 vertical high power milling machine—Bidder 146, Fairbanks Company, New York, $1459.

Class 42.—One toolmakers' lathe—Bidder 43, Hendey Machine Company, Torrington, Conn., $598; 62, Manning, Maxwell & Moore, New York, $598; 72, Niles-Bement-Pond Company, New York, $543; 146, Fairbanks Company, New York, $715.

Class 43.—One new model turret lathe—Bidder 86, Pratt & Whitney Company, Hartford, Conn., $467; 144, Frevert Machinery Company, New York, $412.

Class 44.—One 32-in. heavy duty back geared crank shaper—Bidder 62, Manning, Maxwell & Moore, New York, $928; 72, Niles-Bement-Pond Company, New York, $673.

Class 51.—One locomotive jib crane—Bidder 10, American Hoist & Derrick Company, St. Paul, Minn., $7667; 16, Browning Engineering Company, Cleveland, Ohio, $6800 and 7313; 20, Brown Hoisting Machinery Company, Cleveland, Ohio, $8885; 48, Industrial Works, Bay City, Mich., $6832; 80, Orton & Steinbrenner, Chicago, Ill., $6250.

Class 54.—One electrically driven reversible two-speed deck winch—Bidder 46, Hyde Windlass Company, Bath, Maine, $2690; 57, Lidgerwood Mfg. Company, New York, $3175; 126, Williamson Brothers Company, Philadelphia, $2900.

The Western Electric Company, New York, has been awarded contract for an electric motor for the Atlanta Penitentiary at $425.

Under bids opened April 3 the Fort Wayne Electric Company, Fort Wayne, Ind., has been awarded contract for a 50-kw. generator set for the New Orleans Navy Yard at $1992.

The following awards have been made for machinery for the navy yards, bids for which were opened April 6:

Williamson Brothers Company, Philadelphia, Pa., class 71, three ash hoisting engines, $375.

Western Electric Company, New York, class 151, seven induction motors, $609.25.

Great Northern Ore Properties in 1908.

The second annual report of the trustees of the Great Northern Iron Ore Properties, issued April 23, shows that for the fiscal year ending December 6, 1908, the receipts were $1,749,214, of which $1,500,000 was distributed to certificate holders and $75,390 was paid as expense of administering the trust. The surplus is now $256,074. The shipments of ore from the Mesaba Range properties leased to various mining companies were 1,468,925 tons in 1908, against 3,281,061 tons in 1907. Of the work done in 1908 by the Great Western Mining Company, the subsidiary of the United States Steel Corporation, which negotiated the Great Northern or Hill ore land lease, the report says:

A monthly average of 77 drills has been maintained, as against the 40 required by the terms of the lease. Exploration work has been completed on about 3600 acres of the leased lands. None of the properties covered by the lease to the Great Western Mining Company was put on a shipping basis during the year. Development work, consisting of surface stripping to the extent of approximately 5,500,000 cu. yd., and the construction of yards, tracks, &c., has been conducted on several properties at large expense and in a manner to prepare these properties for mining and shipping large amounts of ore. The Great Western Mining Company's expenditures for exploration and for development work have aggregated more than $3,000,000.

The Great Western Mining Company paid in January, 1909, the minimum royalty for 1908. The report states that the companies owned by the trust, control, by ownership and leasehold, valuable iron lands in the Mesaba District of Minnesota, aggregating 65,091 acres, of which there had been leased prior to December 7, 1906, 1596 acres. The lease to the Great Western Mining Company covers 39,296 acres, of which there are owned in fee, 19,934 acres; owned in fee jointly with other parties (of which the trustees' proportion is 7915 acres), 15,972 acres, and held by lease, 3390 acres. Of the above fee lands, 3691 acres are owned by the North Star Iron Company, of whose capital stock the trustees hold about 91 per cent. The Great Western lease provided for the mining and shipping of at least 1,500,000 tons of ore in 1908, and for an additional 750,000 tons each year, until the total annual amount shall reach 8,250,000 tons in 1917, this being the minimum thereafter.

Chairman E. H. Gary of the United States Steel Corporation says that the report that the corporation has issued the $11,921,000 of bonds shown by the last annual report to be in the treasuries of various subsidiaries is exaggerated. From time to time, he said, the bonds of the corporation's railroads have been sold to meet new construction outlays, but that no large amounts had been put out recently.

During a severe wind storm that swept over Cleveland April 21, a number of manufacturing plants were severely damaged, some buildings being torn down and others partially wrecked. Those that suffered the most from the storm were the Wellman-Seaver-Morgan Company, the Standard Tool Company, the Cleveland Co-Operative Stove Company and the National Safe & Lock Company.

HARDWARE

THAT is a noteworthy achievement of the Hardware Mutual Fire Insurance Company of Minnesota. During the month of March the insurance written amounted to $1,540,499, with premiums aggregating $30,510.11. The total fire losses during the month were $177.97. This showing eclipses all records in the history of this pioneer company in the Hardware mutual fire insurance field and is a tribute to the able and energetic management which has characterized it from its formation nine years ago. It is also suggestive of the footing which this form of insurance has secured in the trade. Merchants throughout the country are awaking to the opportunity thus presented of placing insurance with Hardware mutual companies of recognized standing and responsibility at a substantial saving in cost as compared with the rates of the old line companies. The development of the mutual insurance idea in Hardware and other lines of trade is doubtless regarded with increasing concern by the companies whose business will be materially affected if the movement continues, as seems likely, to gain momentum. This is evidenced in the efforts which are made to prevent the organization of companies of this sort by the passage of hostile legislation. With a saving of from 25 to 50 per cent. as an inducement, mutual fire insurance will doubtless continue to commend itself as long as the various companies prosecute business on the wise and conservative lines thus far followed.

It is natural that there should be a desire on the part of the various Hardware mutual insurance companies to extend their business and write as much insurance as possible. Within certain bounds there is no objection to such growth, but there are considerations which should be borne in mind in this connection. It is not desirable, for example, that the companies should strive to pay too large rebates. This might be carried to an extent that would imperil the safety of the insurance in case of an exceptionally serious conflagration or series of conflagrations. It would appear to be a wise policy to keep up the surplus, so that the danger point will be avoided, while at the same time the companies will be in a position to tide over unusually heavy losses without a reduction of dividends. There might also arise a spirit of competition between the different companies in the endeavor to offer larger rebates than the others.

For another reason it is undesirable to stimulate the growth of this form of insurance by furnishing it at very low cost. One of the things to be taken into account in a far sighted view of the question is the fact that as soon as a mutual insurance movement attains sufficiently large proportions it will be antagonized more aggressively than it is at present by the vested interests. This opposition will, it is safe to say, assume sooner or later some form likely to be troublesome to mutual interests. One great advantage under which this mutual insurance now works is the fact that it follows the stock companies in the rates charged and in the adjustment of losses, and thus escapes a heavy expense which the old line companies are compelled to bear. In what way the hostility of the vested insurance companies will show itself cannot be foretold, but it would be unreasonable to suppose that the great companies would be unable to find a way to safeguard their business and make it less easy for the mutual companies working at very low expenses to continue the inducements they are now offering. Too rapid growth will tend to stimulate the opposition of the great insurance interests.

Condition of Trade.

Reports in regard to business are on the whole more satisfactory than for some time. There is a better feeling in Hardware circles and the indications are reassuring. The improvement is noticeable in the demand, as in some lines manufacturers are receiving fair orders from the merchants and the disposition not to adhere as closely as heretofore to the policy of extreme conservatism is observable. It is a good indication that Builders' Hardware continues to move freely, and the manufacturers in this branch find little reason for complaint in regard to the volume of the business they are doing. The tone of the general market in price is without important change, there being a good deal of irregularity, and the giving of concessions more or less liberally still continues. There are, however, exceptions to this, and many lines are held with a good degree of firmness. Wire Nails and Wire continue to show weakness and this undoubtedly has some effect on the market as a whole, as these great staples are looked upon by many as representative. The trade will accordingly be glad when the readjustment of values in this line is accomplished, whether it be by a gradual descent, as it has been thus far, or by more radical action, as a substantial reduction is made for the purpose of reaching a firm basis from which advances may in the ordinary course of things be expected. If the question were submitted to the trade as to which course they consider the more desirable there would be a great deal of difference of opinion on the subject. The slightly better feeling in some branches of the Iron market is an encouraging factor in the situation, leading many to the hope that the turn in the market and a return to greater confidence and better business may come before long. The uncertainties about tariff legislation continue to affect business in some lines which are most nearly concerned, but the trade generally are not anticipating radical action which will greatly disturb existing conditions.

Chicago.

According to the character of industry supporting it in various localities throughout the country, trade is more or less vigorous in its development. Communities, for instance, dependent to a large extent upon the railroads or manufacturers for their commercial prosperity reflect the retarded activity of these interests in a sluggish demand of extremely slow growth, while, on the other hand, the business coming from purely agricultural sections is in most cases little, if any, below normal. Reports from the West are of a generally encouraging nature, but eastward from this market they are less satisfactory, due doubtless to the causes above indicated. How great has been the transformation that has taken place in those parts of the West and Northwest which, but a few years ago, were regarded as almost beyond the confines of habitable territory, is emphasized by the striking evidence of resourcefulness displayed in present conditions. The results of a recent sale of bonds for municipal improvements in a Dakota city of about 10,000 inhabitants furnishes an instance in point. Bids on the securities amounting to $100,000 were tendered by representatives from a number of the leading financial cen-

ters, but the entire issue was taken by local capital representing wealth gleaned from the soil. Fortified by a surplus that has transferred them from the debtor to the creditor class, it is not much wonder that the farmers of these regions are buying freely of such goods and material as are required for Fence building and improvements. The further softening of prices in the heavier lines of finished material has naturally had an unsettling effect upon some of the less highly finished Hardware goods more directly influenced by iron and steel values. So long as the materials from which they are made continue to decline, there is no assurance of stability in the prices of such goods. At the same time the situation is being met, not by open reductions of corresponding extent, but rather by such concessions as the circumstances dictate, since it is hoped that an upward reaction may prevent the necessity for permanently establishing the extreme low levels sometimes reached in current transactions. The demand for Light Sheets and Roofing, both Galvanized and Black, is fairly good, although prices have in the past two weeks shown more of a disposition to sag under the stress of competition. In view of the recent advances and the increasing firmness of Spelter, this tendency may not become especially pronounced in Galvanized Sheets. The situation in Wire and Wire products remains practically unchanged, there having been as yet no official changes made in the price schedules governing the operations of the leading interest. Prices, however, are not being uniformly maintained, and in consequence buyers are acting with extreme caution in estimating their requirements, which include only the limited purchases necessary to meet the demands of current consumption.

NOTES ON PRICES.

Wire Nails.—The tendency toward lower values which we have noted in recent issues still continues, and the price of $1.95 to jobbers in carload lots is becoming nominal. Last week we referred to the fact that concessions of from 5 to 10 cents per keg were made, and this price, that is $1.90 to $1.85, continues to represent the market in a general way. A further concession of 5 cents is, however, made in special cases. There is thus a gradual movement in the direction of a lower level which emphasizes the importance of adhering to the policy of conservatism in buying which has been characteristic of the trade for some time. It remains to be seen whether the readjustment of quotations to the existing conditions is going to be by a gradual sliding down to the new level, or by the formal announcement of a new and lower schedule of prices by one or more of the manufacturers. The orders which are received by the mills indicate a very wholesome condition of things in the trade and cover considerable quantities of goods, notwithstanding the caution with which merchants are buying. Jobbers' stocks are evidently in general pretty well reduced, and little is being sacrificed by them as a result of the decline in price which is taking place. The price to the large trade may be quoted in a general way as $1.85 to $1.90, from which concessions are made in special cases as noted above. Smaller merchants, who in the regular course of things are expected to pay about 5 cents a keg more than the jobbers, are frequently able in the present state of the market to escape the disadvantage of this differential.

New York.—A moderate volume of business has been done during the past week without material change in local conditions, although the price of $2.15 per keg is perhaps a little more general than it was. The uncertainty of the situation and the drift toward lower values is preventing any important orders being placed.

Chicago.—In spite of the unsettled condition of prices, the wavering tendency of which has become pronounced, the amount of business being entered by the mills in specifications and new orders is even greater than might be expected under the circumstances. Inasmuch as buyers are closely restricting purchases to present actual needs, it is evident that there is, at least, a fair demand from consumers. Concessions from the regular schedule of 5 cents a keg and even more are being more openly made by some of the leading producers, although no change in prices has been officially announced. Jobbers are in receipt of advices from a prominent interest which is construed as forecasting a contemplated departure from the policy of nominal maintenance of ruling prices. Quotations representing the recognized schedule are nominally as follows: $2.13 in car lots to jobbers, and $2.18 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—As yet the expected announcement from the leading makers of Wire Nails of a revision in prices to a lower basis has not yet been issued, but reports are that this may come within the next few days and be made effective from May 1. Under these conditions the trade is naturally buying as few Nails as possible, orders placed with the mills being in small lots only to cover actual needs. It is not improbable that before another week elapses conditions as to prices of Wire Nails will be clearer than they are now. While the regular price of Wire Nails remains at $1.95 a keg, f.o.b. Pittsburgh, most of the business being placed is taken at $1.90, and in some cases $1.85 is being done.

Cut Nails.—There has been no change in the Cut Nail market since our last report. Demand continues fair in most sections, and prices remain on the same low level, 5 or 10 cents per keg being generally conceded beyond the nominal base of $1.80, f.o.b. Pittsburgh. This is regarded as a close price on Nails made of good material.

New York.—A quotation of $1.95 per keg on Cut Nails is not too low to represent the store price obtainable by average buyers in this market, and this figure is shaded on carload lots. Purchases are light, as the market is regarded as a waiting one.

Chicago.—Beyond a slightly increased demand for Shingle Nails, due to the increasing activity in building, there is no marked change in the movement of Cut Nails. Prices are more or less irregular, there being a lack of uniformity in the quotations of different mills. Concessions of 10 cents a keg, and in some instances even more, are being made from regular quotations, which are as follows: In carload lots to jobbers, Iron Cut Nails, $2.08; Steel Cut Nails, $1.98.

Pittsburgh.—The active opening of the building trade has accelerated demand for Cut Nails to some extent, and we are advised that more Nails are moving out from the mills than for some time, although buying is still confined to small lots covering actual needs. The normal price of Cut Nails in carloads is $1.80 per keg, base, f.o.b. Pittsburgh, but this is shaded 10 cents a keg, and in special cases as much as 15 cents per keg.

Barb Wire.—Prices for Barb Wire indicate a weakness corresponding to that referred to above under Wire Nails, as the tendency in both Nails and Wire is toward a lower level. There is accordingly only a moderate volume of business, and orders are placed only for goods needed at once. The regular quotations, f.o.b. Pittsburgh, which are becoming nominal, are given below, but it should be remembered that concessions from them ranging from 5 to 10 cents are frequently made, while in extreme cases a concession of 15 cents is made:

	Painted.	Gal.
Jobbers, carload lots	$2.10	$2.40
Retailers, carload lots	2.15	2.45
Retailers, less than carload lots	2.25	2.55

Large buyers, though not strictly ranked as jobbers, are often able to obtain jobbers' prices, and on shipments of less than carload lots the differential indicated above is frequently departed from.

Chicago.—Influenced by the same causes which disturb the evenness of values in Wire and Wire Nails, there is an increasing amount of unsteadiness in the price of Barb Wire. Buyers are naturally extremely cautious about future commitments, and as a result trade is closely restricted to the imperative needs of current consumption. Such demand is insistent enough, however, to bring out a fair amount of hand to mouth business, which is made up principally of orders against contracts. These conditions will likely prevail until buyers are assured that a stable level has been reached. We quote, subject to the

conditions above noted, regular prices which are nominally as follows: Jobbers, Chicago, car lots, Painted, $2.28; Galvanized, $2.58; to retailers, car lots, Painted, $2.33; Galvanized, $2.63; retailers, less than car lots, Painted, $2.45; Galvanized, $2.75; Staples, bright, in car lots, $2.25; Galvanized, $2.55; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—It is not improbable that within a few days announcement will be made by the leading makers of a reduction in prices on Barb Wire, which may possibly be effective from May 1. The trade is still confining its policy to buying only in small lots to cover actual needs, and the amount of tonnage moving out from the mills is rather light. We quote Painted Barb Wire to jobbers in carloads at $2.05, and Galvanized at $2.35, but to the larger trade lower prices on Wire for prompt shipment are sometimes made.

Plain Wire.—The market is governed by the same uncertainty that has prevailed for some time and prices continue weak in view of the gradual readjustment which is taking place in Wire products, which are in general, as noted above, about 5 cents lower than last week, when concessions ranging from 5 to 10 cents were obtainable. The regular schedule is still as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Nos.	6 to 9	10	11	12&12½	13	14	15	16
Annealed	$1.80	1.85	1.90	1.95	2.05	2.15	2.25	2.35
Galvanized	2.10	2.15	2.20	2.25	2.35	2.45	2.85	2.95

Chicago.—Widely circulated press reports to the effect that an official announcement of a reduction in prices had been made, while without foundation in fact, have had a disturbing effect upon trade. Prices, it is true, are subject to some shading by leading mills, and within the past week this evidence of weakness has become more pronounced. For the present, at least, the situation so far as any official action is concerned, remains unchanged, but buyers are not buying anything more than is actually required to supply their current necessities. Regular prices, which are being shaded $1 a ton or more, are as follows: Car lots to jobbers, $1.98, f.o.b. Chicago, and to retailers, $2.05.

Pittsburgh.—The trade is momentarily expecting announcement from the leading interest of a revision in prices, and buying is naturally confined to very small orders to cover most urgent needs. Shipments by the mills are light, and these conditions will continue to prevail until the situation is clearer as to the future of prices. We quote Plain Wire at $1.75 and Galvanized at $2.05, f.o.b. Pittsburgh, in carload lots, but these prices are sometimes slightly shaded.

Window Glass.—The market continues quiet and uneventful, with no increase in demand or change in quotations. While indications point to the successful formation of the Imperial Window Glass Company, it is not likely that its consummation will have any appreciable effect on the present fire, some of the plants being already closed down. Machine interests are still quoting 90 and 40 per cent. discount on single and 90, 40 and 10 per cent. discount on double strength. Eastern jobbers are holding Glass at 90 and 35 per cent. discount on single and 90 and 40 per cent. on double strength.

Linseed Oil.—Ordinarily the present should be a good contracting season, but nothing better than a hand to mouth business is being done. Selling at concessions by second hands continues to disturb the market. Regular quotations in 5-bbl lots are as follows: State and Western Raw, 55 cents per gallon; City Raw, 56 cents per gallon. Boiled Oil is 1 cent advance on Raw.

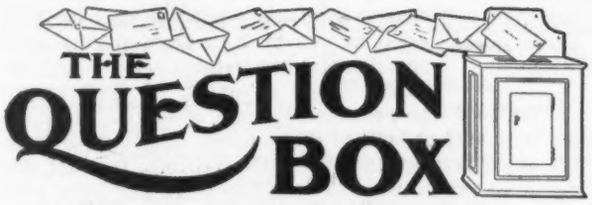
Spirits Turpentine.—During the week prices have declined 2 cents in sympathy with the Savannah market. The business offering is of moderate proportions. The New York market is represented by the following quotations: Oil Barrels, 39½ to 40 cents; Machine Made Barrels, 40 to 40½ cents per gallon.

An Effective Window Display

Razor Window of Geo. D. Boggs & Son, Containing Many Ideas Which May Be Adapted to Other Lines.

AN attractive window display of Safety Razors made by Geo. D. Boggs & Son, Elizabethtown, Pa., is illustrated herewith. It contains hints which will doubtless be of value to many of our readers. In the center of the window was a pyramid, 3 ft. square at the base, 6 ft. hight and covered with red crepe paper. This was used as a background for cartons and display cards. Razors, &c., were displayed on two glass shelves hung on either side of the pyramid, about 3 ft. above the base, and also on the floor, which was dressed with advertising matter, Strops, Shaving Brushes, &c. The back and side wall of the window were covered with white bunting and decorated with showcards and twisted strips of red and green crepe paper.

Safety Razors Well Displayed.



This department is open for the discussion of questions which arise in the practical conduct of the Hardware business. Our readers are invited to contribute, submitting inquiries or answering questions.

Correspondents are expected to give their names and addresses, but in order to encourage frank expressions of opinion the advice of our correspondents will be treated in confidence, names and addresses not being published.

For convenience Questions or Answers should be addressed to THE IRON AGE QUESTION BOX, 14-16 PARK PLACE, NEW YORK.

There is one notable respect in which The Iron Age Question Box differs from that of the Hardware convention. In the Hardware convention a number of Hardware merchants being in attendance answers can be made at once to any inquiry drawn from the Question Box. In the case of The Iron Age Question Box it is quite different, inasmuch as the readers of *The Iron Age* are scattered throughout the entire country and days elapse before the inquiry reaches the majority of them. In view of this fact answers to the questions submitted cannot be given in one issue, especially as the answers made to some of our correspondents suggest ideas to other merchants who did not reply on the first presentation of the query. This is illustrated below where a response comes from the Pacific Coast, meeting an objection made by correspondents in a former issue who took the ground that the departmentizing of Hardware stocks of moderate size is not practicable.

We will ask our readers to bear in mind that, while we are glad to have prompt answers to the questions referred to them, we invite later replies, and especially replies that are suggested by any of the letters printed in these columns. We thus solicit the co-operation of the trade in several ways:

1. IN SENDING IN QUESTIONS.
2. IN ANSWERING QUESTIONS REFERRED TO OUR READERS.
3. IN SUPPLEMENTING REPLIES PUBLISHED IN THIS DEPARTMENT OR GIVING ANOTHER SIDE TO ANY OF THE QUESTIONS DISCUSSED.

Departments in Hardware Stores.

In our issue of April 15 were presented a number of answers to question No. 4, relating to departmentizing stocks in Hardware stores. A number of other expressions have since been received, the States heard from now including New York, Connecticut, Illinois, Georgia, Indiana, Vermont, Iowa, Wisconsin, North Dakota, Ohio and California. Answers from smaller merchants continue to indicate their belief that their business is too small to be handled economically in this way. A merchant in Illinois writes:

We have our stock arranged in departments, but do not as yet charge each department up with stock and keep their sales separate, nor do we know of any one in this territory who does.

In a similar vein a merchant in North Dakota makes the point that the expense and trouble would offset advantages.

We believe that the expense and trouble necessary in keeping track of the profits of each department would be greater than any benefit derived, and if a man follows this to its legitimate conclusion, it would also be necessary that he should keep an account of the expenses in detail for each department. We believe that at the end of the year the merchants who tried it would find that the profits they had figured in each department would not be the same as the net profit on the entire business.

Advantageous to Small Merchants as Well as Large.

On the other hand it is argued that it is just as important for a small merchant to know what different lines are paying as for a large one. This is suggested by the following from a merchant in California:

Departmentizing is a real advantage not only to large concerns, but to the small equally as well. It impresses the writer as being one of the most important things to know what every line of goods carried by him is paying. It is a simple matter to keep track of the different lines, and at the end of the year a merchant is enabled to shut off those things which do not pay, and cater to those that do. We do not find it any trouble and cannot see why any other Hardware store should. By all means urge the smaller dealer to keep his business well segregated so that he may know exactly what he is doing.

Locating the Strong and Weak Points.

A merchant of experience in the metropolitan district believes that some department store methods can be applied with advantage to the Hardware business. He writes:

I spent a number of years in the Hardware business, and subsequently was employed for nearly 10 years in executive capacity with metropolitan department stores, and I have often thought that their methods of departmentizing stocks could be applied with great advantage to a Hardware business. I have noticed at various times some of these methods described in detail in your columns. To my mind it is highly important that every business should be so systematized that the strong and weak points can be located at any time. To the merchant who studies his figures such a system is certain to enable him to overcome difficulties and to build his business up to larger proportions than would otherwise be possible.

Selling Stock to Farmers.

QUESTION No. 13. *Would it pay in a small town surrounded by good farming territory, with competition on all sides, to incorporate and sell a small amount of stock to influential farmers, from* $100 *to* $300 *to a man, perhaps* $3000 *worth of stock in a* $20,000 *incorporation? Would it pay to be incorporated, anyway?*

The first part of this question, of course, suggests the great importance to merchants situated in agricultural territory of going after the large and profitable business of the outlying farming districts, and offers an interesting plan for influencing this trade. Some readers seem to think that the idea suggested in question No. 13 is worth trying, as shown by the following from the States indicated:

PENNSYLVANIA: While I do not know of a case where the matter has been tried, yet I am of the opinion it would pay to try it, thus encouraging the farmers of that neighborhood to trade at the store where they have a special interest in the profits of the business.

CONNECTICUT: We have never had or known of any such case, but in our opinion it seems very feasible and would probably be the means of holding a greater portion of customers than the merchant could get in any other way where there is sharp competition. However, this is only a theory and may be all wrong.

MICHIGAN: It may not be a bad proposition to try what Pennsylvania Hardware merchant wants to get at, and he is likely to have some good agents at little cost,

who will help increase his business. The amount of capital he has and from what I would judge he could swing, I believe would be sufficient without having any extra stockholders. Still it might be worth while trying.

PENNSYLVANIA: Any one contemplating distributing stock would necessarily have to be incorporated, and whether they gave any stock on the outside or not the corporation feature would be a good one. We do not know of any case similar to the one mentioned, but we do know of Hardware people owning stock in manufacturing corporations with whom they do business, and think it helps the factory as well perhaps as the man owning stock, as he will in his own interest purchase all the goods he can from factories in which he holds the stock. How this would work in a community such as named, we are not able to state, but we feel if your correspondent would distribute his stock in his own neighborhood to parties who are good buyers of his goods, they no doubt would give him the preference, and, in addition, be helping themselves through their investment, but think the party holding it would be the best judge, as he would be better acquainted with the circumstances connected with the territory in which he is doing busibusiness.

How It Might Work.

MAKING GOOD IN BUSINESS

HINTS AND SUGGESTIONS FROM MANY SOURCES

The rule, "Do not put all your eggs in one basket," does not apply to a man's lifework. Put all your eggs in one basket, and then watch the basket, is the true doctrine—the most valuable rule of all. *Andrew Carnegie.*

What Constitutes a Successful Salesman?

IN an old edition of Webster's Dictionary the definition of the word "salesman" is given as "one who finds a market for the goods of another man." It might be changed to read: "one who finds a market for goods." There is a sermon in this definition. A salesman in the true sense is not merely "one who sells goods," but "one who finds a market for his goods." In the Hardware business, as well as in other lines which have their close and untiring competition, the same requisites are necessary to make a man entirely successful in the fullest sense of the word, and this does not mean successful for one trip only, but continually so, his influence and hold on his trade growing as the time of his service lengthens.

Requisites of a Salesman.

The Development of Salesmanship.

A thoroughly successful salesman must necessarily be born with a natural gift for selling goods. On this foundation he must build for himself by hard work, close application and earnest thought the structure he wishes to make perfect, and complete it entirely himself by the beautiful decorative work and the harmonious colorings necessary. The walls should be built by having a thorough knowledge of his goods—not to know as much as his competitors, but more—a knowledge of his business that will shine so brilliantly before his trade that they will come to recognize him as an authority in his line—a knowledge that will soon be known so well by the merchants and the clerks of the merchants that they will use him as their referee and await his arrival for his suggestions to decide this point or that.

Knowledge of Goods.

The partitions in this interesting structure should be used in establishing storerooms to keep intact the knowledge of side lines his house may be interested in, and to draw from quickly when occasion requires without being humiliated to the extent of saying, "I don't know."

A Well Stored Mind.

The roof, the protector in time of storms or uncertainty, should be built of character—a character so forceful, so pronounced, that the trade recognize the fact that what you say is true, that you believe it, that your word is absolutely reliable. Character to a successful salesman is what good credit is to a business man and should be guarded most zealously. It enables him to hold his business when times are dull, as good credit enables a business man to tide over a financial crisis where others fail.

Character.

The windows necessary in this building are the cultivation of tact—the light that permeates the brain and indicates to us when to and when to not—the proper time—the proper place—the words to use—how many are enough—when to stop—who to say this to, and who to say something entirely different to. You would not rent a building without windows, and a man cannot make a success in selling goods without tact, and just as windows have to be cleaned, so tact has to be cultivated continually by thoughtfulness and study. Personally, I will say it is the most important requisite in selling goods, and to me has been the one that has required the greatest amount of careful thought.

Tact.

The completion of this superb creation, the decorative work, the harmonious coloring, the finishing touches, are the friendships established, the pleasant smiles, the hearty greetings, the wholesome stories, the ability to make others happy by your daily contact, the enthusiasm displayed always of your goods, your specialties, your house, your president, your manager, your office boys, the enthusiasm that makes the trade feel that you have the best house, the best goods, the best service and the highest standard of any house in the world.

Friendliness and Enthusiasm.

Same Requirements in Every Line of Business.

With the above qualities cultivated to the fullest extent, any man will know how to treat each individual case. No matter whether selling Paints and Colors with your additional lines, Hardware and the thousands of items that belong to our business, groceries or other merchandise, he will naturally ascertain the goods his customers are low on. He will study their wants, their weak points, and he will take orders—large orders, and more orders, as a matter of course. Can you imagine a complete man built along the above lines entering a store and asking a merchant if he wanted anything, or accepting as final the merchant's statement that he would have an order next trip? No, a salesman is a man "who finds a market for goods"—he is continually loading up his head with new ideas, new knowledge, new illustrations for the benefit of himself and his trade. He is constantly devising new methods of selling goods and not spending his evening hours writing the house why trade is dull.

Force and Initiative.

The Example of the Magnet.

In conclusion, I want to illustrate how we can in our daily life absorb new ideas, new knowledge, and improve our methods little by little, by repeating an incident which made a great impression upon me and the credit of which belongs to the honored president of a house it was my privilege to be connected with: "Noting over the chemist's table a Magnet which hung loaded with a collection of various tools and weights, I asked: 'What is the Magnet doing?' 'I am loading it up,' the chemist answered; 'it has been lying on the table doing nothing and losing its power, so now I am giving it something to do, a little more every morning, and it is gaining, it is growing stronger every day,' and he added a small File to the clump attached to the Magnet. 'That's the way,' he continued, 'God makes magnets and men. If they loaf around and do nothing, they can't do anything—they lose their force—but give them some work and they will soon be good for more than you ever dreamed they could do. Magnetic power and muscles are developed by something to do—yes, and so are the brains and souls of men.'"—*Ralph Brown.*

Magnets and Men.

Hardware Organizations.

Coming Hardware Conventions.

MISSISSIPPI RETAIL HARDWARE ASSOCIATION, May 11 and 12, at Jackson. Headquarters at Edwards' House. Convention in Senate Chamber. Secretary, Jno. E. Sommers, Clarksdale.

ALABAMA RETAIL HARDWARE ASSOCIATION, May 12, 13 and 14, at Birmingham. Headquarters at Hotel Hillman. Secretary, L. G. Smith, Ensley.

GEORGIA RETAIL HARDWARE ASSOCIATION, May 18, 19 and 20, at Valdosta. Secretary, E. E. Dekle, Valdosta.

NATIONAL RETAIL HARDWARE ASSOCIATION, May 25-28, Milwaukee, Wis.

AMERICAN HARDWARE MANUFACTURERS' ASSOCIATION, June 9, 10 and 11, at Pittsburgh. Headquarters at Fort Pitt Hotel.

SOUTHERN HARDWARE JOBBERS' ASSOCIATION, June 9, 10 and 11, at Pittsburgh. Headquarters at Hotel Schenley.

ARKANSAS RETAIL HARDWARE ASSOCIATION, June 22, 23 and 24, at Fort Smith. Hardware Exposition at Tabernacle Hall. Secretary, W. L. Harlan, Little Rock.

CAROLINAS RETAIL HARDWARE ASSOCIATION, July 6, 7 and 8, at Asheville, N. C. Headquarters and Hardware Exposition at the Battery Park Hotel. Secretary, T. W. Dixon, Charlotte, N. C.

SOUTH CAROLINA RETAIL HARDWARE ASSOCIATION, Charleston, in July, the exact date not having yet been determined. Secretary, Paul McLure, Greenwood.

MICHIGAN RETAIL HARDWARE ASSOCIATION, August 11, 12 and 13, at Saginaw. Hardware Exposition at the Auditorium. Headquarters at Hotel Vincent. Secretary, A. J. Scott, Marine City.

FLORIDA RETAIL HARDWARE ASSOCIATION, October 12, 13 and 14, at Jacksonville. Secretary, W. K. Jackson, Lakeland.

Texas Hardware Jobbers' Association.

The fourteenth annual convention of the Texas Hardware Jobbers' Association was held in Houston on the 19th, 20th and 21st insts. The attendance of the members, as well as of manufacturers and their representatives, was the best in a number of years. From a business standpoint, the meeting was very interesting, and the reception and entertainment accorded by the manufacturers and the Houston jobbers was of a character that made the gathering one of the most enjoyable ever held by the association.

For the ensuing year the following officers were chosen: E. A. Peden, Peden Iron & Steel Company, Houston, president; R. L. Penick, Stamford, first vice-president; A. C. Gaeth, Austin, second vice-president; R. F. Bell, William Henry & R. E. Bell Hardware Company, Fort Worth, secretary-treasurer. Executive Committee: F. W. Heitmann, F. W. Heitmann Company, Houston; W. L. Sanford, Roberts, Sanford & Taylor Company, Sherman; George Trumbull, Dallas, and R. G. Wilder, Beaumont.

Carolinas Retail Hardware Association.

The annual year book of the Retail Hardware Association of the Carolinas has lately been issued. It contains lists of the members of the association in both North and South Carolina, together with a full list of all the Hardware merchants of the two States. It also presents particulars in regard to the association, its officers, committees, &c., and of course presents the programme for the annual meeting, which will be held at Asheville on July 6, 7 and 8. As already noted, the headquarters of the association and exhibits of manufacturers and jobbers will be at the Battery Park Hotel, the business sessions being held in the Auditorium. The programme of the meeting includes formal addresses by Hon. W. S. Hall, Gaffney, S. C., on "Collection of Debts by Law:" by R. H. McDuffie, Fayetteville, N. C., on "The Only True Method That Produces Real Success," and by J. M. Sullivan, Railroad Commissioner, Anderson, S. C. At the morning session, July 8, there will also be addresses by M. L. Corey, secretary of the National Retail Hardware Association, and by R. R. Williams, Hardware editor of *The Iron Age*. The Question Box will be given due consideration, and will be under the efficient charge of National Secretary Corey.

T. W. Dixon, secretary, Charlotte, N. C., advises us that the indications promise a record breaking attendance at Asheville, and from inquiries for exhibition space and the interest manifested in this feature an attractive line of exhibits seems assured. The entire membership and especially the officers and members of the committees are working effectively with the secretary to increase the numerical strength, and during 1909 thus far nearly as many members have been added to the roster as during the whole of last year. It is regarded as likely that by the time the convention week rolls around more than 200 members will be on the list.

Mississippi Retail Hardware Association.

The Mississippi Retail Hardware Association, John E. Sommers, Clarksdale, secretary, has sent out its souvenir programme relating to the third annual convention, which will be held in Jackson on May 11 and 12. The official headquarters of the association will be at the Edwards House, the convention proceedings being held in the Senate Chamber in the Capitol building. Other hotels in Jackson, at which accommodations may be had, are the Lemon, Royal and Lawrence. The Southeastern Passenger Association has granted a special rate for the round trip on the certificate plan.

During the convention there will be formal addresses by W. D. Simmons, president of the Simmons Hardware Company, St. Louis, whose topic will be "The Dealer's Best Friends;" M. L. Corey, secretary of the National Hardware Association, and others. A good deal of time will be devoted to discussion resulting from queries coming up through the Question Box, and this feature of the proceedings will be under the efficient supervision of Mallory Davis, Itta Bena. The principal feature of entertainment will be a reception and ball at Pythian Castle Hall on Tuesday evening. The list of members which appears in the programme shows that the association has been working energetically in this direction, and that many of the most enterprising and successful retail houses in the State have become affiliated with it.

British Columbia Hardware Association.

The eighth annual meeting of the British Columbia Hardware Dealers' Association, held at Vancouver, British Columbia, recently, was well attended by the Hardwaremen doing business in the coast cities of Vancouver, New Westminster and the surroundings districts, but the balance of the province was very poorly represented, although invitations had been sent to each merchant in the province. President Charles Snell, Vancouver, in his opening address referred to the pleasant relations existing among the trade in the districts organized, prices being well maintained and there being not a single failure to report among the members during the depression. Vancouver, said Mr. Snell, has more Hardware stores to its population than any other city in America, and, he argued, the business being divided up among so many made it necessary that the merchants hold close together to avoid price cutting and secure profitable prices.

Secretary W. J. Butt, Vancouver, reported that nine general meetings were held during the year, while over 30 special and committee meetings had been held. The attendance at these meetings had increased over double during the year and the association is showing a healthy growth.

The Lien Law Committee reported that after appearing before the Legislature several times, it had secured a promise that the Government will introduce legislation along the desired lines next winter.

A Price Committee was appointed to follow the market prices and conditions and offer recommendations at regular and special meetings. Another committee dealing with the credit system was also continued in office.

The election of officers resulted as follows: President,

W. C. Stearman, Hodgson & Stearman, Vancouver; vice-president, H. T. Kirk, New Westminster; secretary-treasurer, William J. Butt, Vancouver; Executive Committee: H. Martin, George Hunter Hardware Company, Vancouver; G. Blakely, T. J. Trapp & Co., New Westminster, and W. R. Owens, J. A. Flett, Ltd., Vancouver.

Question Box Discussion.

For the first time in the history of the association a Question Box discussion was held, under the leadership of H. Martin, Vancouver, the questions being received and read the first day, while the discussion was held the second day. One question asked if members should meet the prices quoted by mail order houses. The answer was that if the merchant would investigate he would find that with freight charges included and delays considered, the retailer's price would compare favorably with the catalogue house's price.

A second question asked if a minimum first cash payment should be established on all Stoves, Ranges, &c., sold on the installment plan, say at a value of $35 and upwards? The general opinion was that it was not advisable to sell Stoves or Ranges on the monthly installment plan, as once a fire has been placed in a Stove its sale value decreased 25 to 50 per cent., and that if sold at all on the installment plan at least a 50 per cent. payment should be collected and the balance as soon as possible.

Another query made was as to what would be considered a fair margin on Shelf Goods. The opinion expressed was that the present margin on Shelf Goods was entirely too low, as many merchants neglected to take into consideration that it takes nearly 20 per cent. of the gross sales to run a retail store and while 40 per cent. on certain articles may seem to be a large profit, yet it should be remembered that these articles were all of small value and would amount to only a small proportion of the gross sales (made up of heavy goods, &c., on which the margin is very close), and further that there can be no hard and fast rule for a standing percentage on any line of goods and that the merchant must learn from experience.

A fourth question, "What would be a reasonable monthly amount for a retail Hardware store to spend on advertising, and is $25 per $1000 gross sales too much?" brought out the opinion that this amount was not in excess provided results were obtained, but as there were so many avenues to advertise it was impossible for any one to say just what amount should be expended for this purpose.

The convention closed with a banquet, at which the employees of the city stores were guests, along with the members of the association. The suggestion was made that a picnic of the Hardwaremen in the Pacific Coast cities be held during the coming summer in order to get the members better acquainted with each other, it being generally recognized that the better a dealer knows his competitors the less likely is he to cut prices and compete unfairly.

Ontario Retail Hardware Association.

The Ontario Retail Hardware Association has decided to run an excursion to Montreal from all points in Ontario toward the end of August, the members taking their wives and as many as possible making the return trip to Toronto from Montreal by boat. The Montreal Hardware manufacturers and wholesalers will arrange a programme of entertainment for the visitors. It has also been decided to hold the 1910 convention at London, Ont., in February or March next. A trade exhibition will be held during the convention. Vice-President A. Ballantyne, Brantford, and Secretary Weston Wrigley, Toronto, have been named as fraternal delegates to attend the annual convention of the National Retail Hardware Association at Milwaukee in May. J. E. McRobie, Winnipeg, secretary of the recently reorganized Winnipeg Retail Hardware Association, may also attend as a fraternal delegate.

VON LENGERKE & DETMOLD, New York City, have located in the Fifth avenue building, just erected on the site of the old Fifth Avenue Hotel, Fifth avenue, Twenty-third to Twenty-fourth streets. The firm, established in 1882, moved three years ago from 318 Broadway to a store opposite the Waldorf-Astoria Hotel, and the present removal is to obtain even larger and more central quarters in what is reputed to be the busiest shopping district in New York. In addition to their large assortments of Sportmen's Supplies, such as Shotguns, Rifles, Sportsmen's Toggery, Cameras and Photographic Supplies, Golf, Tennis and Athletic Goods, Skates, &c., they have supplemented their stock by adding comprehensive lines of the numerous kinds of Cutlery, Leather Goods, Games, Cards, Electric Novelties, Brushes, Humidors for tobacco, Cabinets and Insulated Bottles.

The Tariff on Cutlery.

Memorandum Relating to the Cutlery Schedule Sent to the Senate Committee by the New York Importers of Cutlery.

UNDER date of the 24th inst. a committee of importers of New York City submitted to the Finance Committee of the United States Senate the following brief advocating a modification of the Cutlery schedule in the proposed Senate bill:

Referring to the amended Payne tariff bill, as reported in the Senate by Mr. Aldrich on April 12, 1909, we would like to record a protest against certain provisions in paragraph 151.

On page 50, starting with line 2:

That any of the foregoing knives or erasers, if imported in the condition of assembled, but not fully finished, shall be dutiable at not less than the rate of duty herein imposed upon fully finished knives and erasers valued at more than three dollars per dozen.

The word "fully" should be omitted and the sentence left to read, "but not finished," &c., as it would then be open to the interpretation that cheap articles that are commercially known as finished Knives would not be prohibited. It is reasonable to expect that a Knife that costs $2 per dozen, foreign value, will be better finished than the Knife that costs 50 cents per dozen. If this clause is aimed at so-called "Skeleton Knives," sold to silversmiths and goldsmiths for the purpose of fitting with solid silver and solid gold handles, then the paragraph should be changed to read:

Excepting such mounted knives which are known to the trade as "skeleton knives," but which are finished as to grinding, polishing and assembled, these knives should pay no higher duty than provided for in the regular schedule for pocket knives, in accordance with their value.

Then starting with line 20 on this page:

Provided further, That all the articles specified in this paragraph shall have the name of the maker and beneath the same the name of the country of origin die sunk conspicuously and indelibly on the shank or tang of each and every blade.

A strong objection to this clause, reading "the name of the maker," is that it will divulge trade secrets.

American merchants who sell and distribute Cutlery use either their own firm name or trade names that they have used oftentimes a long term of years. These firm and trade names have become thoroughly well known and extremely valuable. A change so radical as the one proposed, which requires the name of the maker to be put on the tang of each and every blade, would necessitate the elimination of brands which are of great value to merchants in the United States who own and use them. The use of these brands in itself is a guarantee of quality to those who purchase them, even more than the name of the maker. We therefore ask that this provision be amended to read:

Provided further, That all the articles specified in this paragraph shall have the name of the maker, firm or trade name, wherever possible, and beneath the same the name of the country of origin die sunk conspicuously and indelibly on the shank or tang of each and every blade.

We ask that the words "wherever possible" be inserted, for the reason that it is not possible to mark every blade in every Pocket Knife. Some blades in Scissor Knives, as well as the very small blades in Ladies' Penknives, have not sufficient tang surface to admit stamping the maker's name or a firm name and the country of origin beneath. However, should there be no modification of the provision with regard to marking every blade by the "die sunk" process, and if it should become a law in its present state, then at least six months' time should be given the merchants and importers to prepare for the change. Every manufacturer has on hand a large stock of blades which are marked in compliance with the present law. All importers and merchants are anxious to comply with the requirements of marking every blade with the name of the country of origin, but are strongly opposed to the "maker's name" appearing on the goods. Such a law

will cause hardship, injury and severe financial loss to firms who now use established and well-known trademarks and firm names.

Duty on Razors.

The following table shows the comparative rates of duty as provided in the various bills.

Dutiable value per dozen.	Present Dingley rates.		Proposed House rates.		Proposed Senate bill.	
$1.25	$0.69	44%	$0.88	70%	$1.22	98%
1.43	.71	50%	.93	65%	1.28	90%
1.49	.72	48%	.95	65%	1.32	88%
1.55	1.23	80%	1.47	95%	1.82	117%
1.67	1.25	75%	1.50	90%	1.87	112%
1.90	1.29	68%	1.57	82%	1.96	103%
2.02	1.30	64%	1.61	80%	2.45	121%
2.14	1.32	61%	1.64	77%	2.51	117%
2.38	1.36	57%	1.71	72%	2.63	111%
2.62	1.39	53%	1.79	68%	2.75	106%
2.86	1.43	50%	1.86	65%	2.87	100%
3.57	2.46	69%	2.82	79%	3.23	90%
4.28	2.60	61%	3.03	70%	3.68	86%
4.76	2.70	57%	3.17	67%	3.82	85%
	Average, 56%		Average, 75%		Average, 100%	

The present rates average about 56 per cent. and the average duty under the Senate bill will be about 100 per cent. (We do not take into account the class of Razors that cost less than $1 per dozen, on which the Senate bill puts a duty of 45 per cent. Goods that would be imported under this schedule are worthless to the consumer.) The duty as proposed will prohibit the importation of Razors to a great extent. Razors cannot be classified as luxuries. They are necessary tools of 150,000 to 200,000 barbers in this country, and are an absolute necessity to the poor as well as to the rich. The consumer is forced to pay more for his Razor and the barber more for his working tool.

The actual amount of capital invested in the Razor industry in the United States is less than the amount of duty collected on Razors in the fiscal year of 1907. The prohibitive character of the Senate bill on Razors will cut down this revenue very materially, and ultimately the consumer will pay a much higher price for Razors than the price he is paying under the present bill. Thus, figuring that 150,000 dozen Razors would be imported under the Senate bill—which would be about 100,000 dozen less than in previous years—the consumer would at least have to pay $375,000 more per annum to encourage the Razor industry in this country.

The only way the manufacture of Razors can be carried on successfully is by the gradual assemblage of skilled labor—men who have learned the trade in boyhood and have continued at it. Cutlery centers like Sheffield, England, and Solingen, Germany, where Razors have been made for centuries, have acquired communities of skilled workmen in the gradual development of the industry. In Germany and in England the Razor grinders, finishers and forgers earn from $10 to $17 per week in their respective trades. The average wages paid in the United States for the same class of work ranges from $15 to $21 per week. This fact is substantiated by Governmental records. There is no inducement in wages, owing to the cost of living here, to get experienced men in the trade to come to this country from abroad. We cannot see that even the great increase in the duties as proposed will be of any advantage to establish the trade of Razor making in the United States. The manufacturers may be enabled to make some profit themselves by this increase in duty, but it will not help in any way the working man, and by lessening the imports will reduce the revenue on this article which the Government hopes to derive.

The ultimate result, if the Senate bill becomes a law, will be to raise prices on Razors materially, with no benefit accruing to Cutlery workmen in this country. The consumer will have to pay a much higher price for Razors than formerly, as he cannot buy an American made Razor that compares in uniform high quality with those made in England or Germany.

It is our firm conviction that the passage of the Senate tariff bill in its present form will in no way or manner encourage or improve the American Razor industry or protect American labor engaged therein. On the contrary, as a very large percentage of the production of American Razors is the result of machine processes, the element of skilled labor does not materially enter into consideration of the question.

These changes are suggested by a committee of manufacturers and importers who have very large proprietary interests in Cutlery manufacturing plants in this country, and they lay emphasis on this fact to substantiate their right to speak as American manufacturers for American labor, and to show that they will not knowingly cause injury to American industry by urging modifications of certain of the provisions in the proposed Senate tariff bill.

We therefore hope that the Senate bill will be modified and the Dingley rates be allowed to prevail on Razors.

The Happy Hardware Company, Happy, Texas, which has been incorporated with a capital stock of $50,000, fully paid in, handles a line of General Hardware, Farm Implements, Wagons, Buggies, Wind Mills; also dry goods and groceries. The officers of the company are J. P. Pipkin, president; R. G. Oldham, vice-president; J. F. White, treasurer, and S. C. Whitman, secretary.

TRADE ITEMS.

THE WILDER METAL COATING & MFG. COMPANY, Connellsville, Pa., manufacturer of Aluminum Coated Sheet Steel, states that it is meeting with gratifying success in the sale of its product through the East, particularly in the vicinity of New York City. Among the larger concerns which distribute Aluminum Coated Sheet Steel in New York City are the following: Glokner & Blue, 2450-2452 Third avenue; Robert Crooks Company, 135 Front street; Neal & Brinker, 18 Warren street; F. K. Roberts Company, 196 Chambers street; Blue & Queripel Company, 119 East 124th street; Dimock & Fink Company, 200 East 135th street; G. A. Feld & Co., 164 East 129th street; Jersey City Galvanizing Company, 112 John street.

THE UNITED STATES INDESTRUCTIBLE GASKET COMPANY, manufacturer of elastic metal gaskets, has removed from 16 South William street to 50 Church street, New York.

CARPENTER & BAYLES, manufacturers and manufacturers' agents in Hardware and Wood Handles, have removed their office and stockroom from 91 Chambers street, New York, where they have been 20 years, to larger quarters at 79 White street.

IN their midspring catalogue just issued referring to many seasonable and general lines handled by the Hardware trade, Butler Bros., Chicago, Ill., emphatically call the attention of merchants to the importance of keeping the catalogue private, since it contains merchants' costs which consumers should not know.

H. ROBINSON, president of the Imperial Machine Company, Newark, N. J., has sailed for Europe on a business trip in the interest of the patented vegetable paring machines manufactured by the company.

Utica Drop Forge & Tool Company.

THE statement in our last issue that the Utica Drop Forge & Tool Company, Utica, N. Y., had decided to sell its product direct to the retail trade was in error. The company is now disposing of its well-known Utica Nippers and Pliers direct and not through selling representatives, but will continue its policy of reaching the retailers through the jobbers of the country and protecting the latter as heretofore.

THE WATT & HOLMES HARDWARE COMPANY, Cordele, Ga., has just moved into a handsome and commodious new building which was especially erected for its occupation. The building has three floors with a space of 17,800 sq. ft. It is fitted up in the most modern style with every convenience in fixtures, &c., to serve the purposes of the company. In addition to its headquarters at Cordele, the company operates branch stores at Fitzgerald, Douglas, Ocilla and Abbeville. The president of the concern, Jas. Watt, Thomasville, Ga., is interested in the houses of Jas. Watt & Bro., Thomasville; Watt Hardware Company, Waycross; Watt-Sapp Company, Albany, and McDonald Hardware Company, Bainbridge. D. Holmes, manager, is buyer for nearly all these stores.

M. M. HAMILTON, who has for some years been engaged in the Hardware business at Brownstown, Ind., died April 14 after an illness of several months. He was 56 years old.

S. M. LOEWENSTEIN, president and founder of the Hardware and Saddlery business of Loewenstein & Sons, Charleston, W. Va., died at his residence in that city, on the 16th inst., in the 76th year of his age.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

JOS. S. LOVERING WHARTON, Philadelphia, Pa.: Illustrated catalogue of Creasey Ice Breakers and ice users' handbook containing valuable information.

SPRECHER MFG. COMPANY, Ephrata, Pa.: Illustrated catalogue of cast and wrought iron work, such as Cellar Grates, Troughs, Cauldrons, Kettles, Window Guards, Gates, Fences, &c.

PETER'S PUMP COMPANY, Kewanee, Ill.: Catalogue No. 30, for 1909, an elaborate edition printed and illustrated in colors, referring to an extensive line of Force and Lift Pumps, Cylinders and sundries.

HOWLER MFG. COMPANY, Montgomery, Ala.: Illustrated catalogue referring to denatured alcohol burning utilities, including One and Two Hole Stoves and Self-Heating Irons.

FERNALD MFG. COMPANY, North East, Pa.: Illustrated catalogue No. 4, of handy size, referring to Fernald Quick Shift, Burton and other anti-rattlers and carriage and saddlery specialties.

ROCHESTER SAFETY LOCK COMPANY, Rochester, Ind.: Illustrated circulars referring to the Rochester Safety Key and Automobile Lock.

ADVANCE STAMPING & MFG. COMPANY, Indianapolis, Ind.: Illustrated circulars describing the Advance Semi-Collapsible Go Cart and explaining its construction and operation.

PETTINGELL-ANDREWS COMPANY, Boston, Mass.: Illustrated catalogue of Fan Motors, &c., with price-lists of parts.

LYON METALLIC MFG. COMPANY, Aurora, Ill.: Bulletin No. 301A, describing and fully illustrating the construction of Lyon Steel Racks and Adjustable Shelving, Bin Shelves, &c. The book contains important directions for figuring and ordering and complete price-lists of Partitions, Shelves, &c.

WEEKS SCALE WORKS, Buffalo, N. Y.: 1909 catalogue illustrating and listing Scales for various purposes.

AMERICAN SPECIALTY COMPANY, Chicago: Booklet entitled "Drills and Sockets That Are Different," illustrating and listing Collis High Speed Drills, Use-Em-Up Sockets, &c.

BLISH, MIZE & SILLIMAN HARDWARE COMPANY, Atchison, Kan.: Illustrated catalogues Nos. 90 and 91, referring respectively to Harness and Harness Sundries and Fishing Tackle, Baseball Goods, Hammocks, Bicycle Sundries, &c.

CHAS. E. MILLER, 97-101 Reade street, New York: Annual automobile supply catalogue No. 12 for 1909, covering a complete line of Motor Car, Motor Boat and Motor Cycle Parts, Fittings, Sundries, &c.

H. B. FULLER, St. Paul, Minn.: Catalogue for 1909, illustrating and describing the construction and use of the Fuller All Steel Adjustable Scaffolding and All Steel Step Ladder. It also refers to a line of Wall Cleaner Dry and Wet Paste made by the company.

W. C. SHINN, Lincoln, Neb.: Two circulars, blotter and a post card design relating to a line of Copper Cable Lightning Rods, Lightning Arresters and Thunder Storm Demonstrating Machines, also a booklet on "Lightning and How to Control It."

FRAZAR & SALE, LTD., commission merchants, have removed their offices from 63 and 65 Wall Street to the Hudson Terminal Building, 50 Church street, New York. This firm has connections abroad at Yokohama, Kobe, Tokyo, Dairen, Chemulpo and Shanghai.

THE NATIONAL ASSOCIATION OF BRASS MANUFACTURERS will hold its next meeting at the Iroquois Hotel, Buffalo, N. Y., on May 18 and 19.

CONTENTS.

Cost System and Shop Control.

Factory Costs and the Use to Be Made of Them—Competition and Costs—Expense Analysis—Keeping Down Nonproductive Labor and Increasing Piecework—Selling Expense.

The following article is based on an address delivered by B. A. Franklin, Miller & Franklin Company, Boston, Mass., and Pittsburgh, Pa., at the last annual convention of the American Hardware Manufacturers' Association. The subject is of vital interest to manufacturers and has been made a matter of study by the association officers. Their object was not only to get information which would assist the individual members in the operation of their plants, but also by disseminating a more general and accurate knowledge of costs to lead to the maintenance of more profitable and stable market prices. It was in connection with these investigations that Mr. Franklin was invited to address the convention at Memphis, and his remarks were of such interest that they are here reproduced in supplemented form, with diagrams illustrating the important features of a cost keeping system in actual operation.

By B. A. Franklin.

The manufacturing world is made up of large houses producing in the millions, and small ones producing in the hundred thousands, and in any manufacturing plant the conditions are different from those of any other. Consequently, when I speak of certain methods, there will be many who are apt to think that those methods will not apply in their plants. But these things are certainly true of all plants;

The elements of cost are the same;

The methods in principle can all be applied;

Each plant can have a system that is prompt in its action—*i. e.*, one that gives quick results;

In every case the system should be one that is provable with the books, and that is a most important point. So many plants have what I term "cuff costs." They are figured up on the cuff, and when the laundry comes back the costs have vanished.

Economy Synonymous with System.

I think it has been said that I was going to talk on business economies, and I am going to endeavor to do so; but from a long experience I know so well that business economies rest necessarily on a right analysis of the facts of factory progress, that while I know you can have a cost system without business economy, you can't well have business economy without a cost system. So the terms are in their best sense synonymous.

Competition and Costs.

There is a great and growing demand among manufacturers for system, and especially cost system, in their plants, in order that they may know, in their endeavor to meet competition, that they are not selling their goods at prices that are less than cost. When you find a manufacturer who thinks he knows his cost, you will hear him express in very strong terms the wish that his

A Good Thing for the Other Fellow.

FINISHED COST

Catalogue No. 75 Size 6 in.

	DATE STARTED 3/6/08 DATE FINISHED 3/20/08 QUANTITY STARTED 1100 QUANTITY FINISHED 1000			DATE STARTED 5/28/08 DATE FINISHED 6/19/08 QUANTITY STARTED 1050 QUANTITY FINISHED 1000		
Material Note A.	AMOUNT	PRICE	VALUE	AMOUNT	PRICE	VALUE
Steel	2500 lb	$6.00	$15.00	2480	$6.00	$43.20
Iron Castings	400 lb	2½¢	10.00	409	2½¢	10.23
Wood	700 ft	60.00	$42.00	650	$42.00	39.00
Etc.						
Gross Material Cost			97.00			92.43
	% Waste			% Waste		
Cost per 100 Steel	7		.45	2		.43
" " " Iron	2		.10	2		.10
" " " Wood	10		.42	3		.39
" " " Etc.						
Material Cost per 100 of Product			97			92
Labor Note B.	PROD.	EXPENSE %	EXPENSE AMOUNT	PROD.	EXPENSE %	EXPENSE AMOUNT
Operation No. 1 } Dept. 1	.47	150		48	152	
" 2 }	1.14	"	2.42	112	"	2.43
" 3 } Dept. 3.	.30	106		30	106	
" 4 }	.80	"	.85	80	"	.87
" 5 } Dept. 8.	.75	80		80	80	
" 6 }	.60	"	1.10	75	"	1.24
General Factory Expense		30	1.14		30	1.20
Total	3.79		5.51	3.95		5.74
Cost per 100 of Labor and Expense	.038		.055	.039		.057
Summary— Note C Material Cost	97.00			92.43		
Labor "	3.79			3.95		
Expense "	5.51			5.74		
Total Cost of lot to Warehouse	106.30			102.12		
Cost per 100 of " " "	1.06			1.02		
% of Selling Expense to Sales	.10			.11		
Cost of Selling	.14			.15		
Total Cost per 100	1.20			1.17		
Selling Price per 100	1.40			1.40		

Fig. 1.—Finished Cost Sheet of Article Designated as "No. 75, Size 6 In."—It shows in tabulated form the material, labor and expense cost separately with summary; also the total cost of the lot to warehouse and the cost per 100. At the foot of the sheet is entered the per cent. of selling expense to sales, the cost of selling, the total cost per 100 to make and sell, and the selling price per 100. It will be seen that costs on successive lots are shown in juxtaposition to facilitate the comparisons from which the most valuable and practical results of a cost system are obtained.

Notes Concerning Finished Cost Sheet.

NOTE A.—An important feature of the tables showing material cost is that they give a line on waste, showing the number started, the number finished, the per cent. of waste and the material cost per 100 of finished product. Waste may cut heavily into profits, but an efficient cost system permits keeping track of the waste on every lot produced, ascertaining the cause and correcting it, as is shown to have been done on the second lot of goods here referred to.

NOTE B.—In this table under the heading "Prod." is shown the cost of the productive labor for the different operations in each department. In department 1 this is shown to be $.47 + $1.14 = $1.61. The department expense, explained in the text, is in this department 150 per cent. of the productive labor, or $2.42. The expense in departments 3 and 8 is similarly computed. The general factory expense, which must also be added, and which is figured in per cent. of productive labor as explained in the article, is entered at 30 per cent., amounting on $3.79 to $1.14. This added to the amount of expense makes a total of $5.51.

NOTE C.—This summary of cost merely includes the totals already obtained from the preceding tables and presents the final cost to warehouse of each lot, both collectively and per 100. The figures are here brought together in one place, so that the eye of the practical man may quickly grasp the whole situation without recourse to minute details.

MATERIAL SCRAPPED

Date 3/25/07

LOT NO.	NO. IN LOT	PART NO.	MATERIAL	WORKMAN'S NO.	DEPT.	WGT.	NO. PIECES SPOILED	CAUSE
2875	4000	No. 183 Knuckle	Iron Casting	340	3	200 lbs	600	Turned under Size
3289	3500	No. 219 Strap	Steel	316	4	215 lbs	463	Cut too short
2976	5000	No. 402 Handle	Lumber	416	7		219	Knotty

Fig. 2.—Further light on the matter of wasted material is thrown by reports of this character, showing the material scrapped in different departments and giving all important details.

competitors had cost systems. In fact, most of the manufacturers that I meet seem to desire this beneficent thing—the cost system—more for their competitors than for themselves. They say it is their competitor's fault that prices are so low, and that if that competitor knew his costs—but the rest is familiar. I have in mind one manufacturer who offered to pay half the cost if his strongest competitor would get a cost system; but he had just got a good one himself.

Cost System Brings Cost Reduction.

Now a simple and right cost system is really one of the greatest possible economies in a shop. It brings about cost reduction and keys the organization up to the point of constantly doing better and getting better results, if it is properly presented. It brings smooth running and greater profits. A manufacturer with a right cost system never regrets the cost of it to him, nor would be without it.

Keys Up the Organization.

Should Give Few but Vital Figures.

Unfortunately, this desire for cost system has brought into the field as experts many men not sufficiently practical or well trained, who have failed to understand that system is not a matter of books or cards or figures alone, or even of a method here and there, no matter how cleverly that accomplishes some one thing; but system, at its real usefulness, is a plan that gives—in the fewest but vital figures, obtained by the least amount of clerical labor—a picture of the factory life that will show the leaks, and show methods that tend to prevent them. A good cost system should be a series of moving pictures.

A Series of Moving Pictures.

Judgment vs. Facts.

It is a fact, unfortunate as it may be, that the practical man learns to depend on his judgment and the judgment of those around him as to operations, rather than on facts shown by figures. This is partly because his education has not been along the lines of interpretation of figures, and partly because in a majority of cost systems the cost facts are not presented in such a way that they convey a meaning to him. They say figures do not lie, but in many cost systems they are made to be very noncommittal as to the truth.

Figures Can Lie.

Right Cost System Helps Selling Force.

A right cost system is the greatest help a good selling force can have in their struggles in the market place, if they can be shown that the costs are really true ones. It is through an accurate knowledge of the costs of the goods they are selling that a selling force can best meet competition and obtain an adequate profit. I have heard it stated that a large per cent. of goods sold on the market are sold at a loss to the manufacturer, merely because of ignorance of costs.

What a Cost System Ought Not to Be.

It is not my purpose, in talking to you about cost system, to take up much of your time, but to put before you briefly the result of some very practical experience, that leads me to know that a cost system in a manufacturing plant ought not and need not be any of the following things, which it frequently is, viz.:

1. A rough estimate of what the costs should be, never checked by the facts, and generally leading to disappointment when the year's profits are figured; or,

2. A mass of unproved facts, surrounded by a body of clerical labor and red tape; or,

3. Figures so beautifully arranged, or so far behind the times, that it is a shame that they have no significant meaning; or,

4. The scorn of the sales department.

What a Cost System Can Be.

As a matter of fact, a cost system can be and must be, for real service, made to show in a simple way and with small clerical labor the accurate—because provable—costs that will meet the confidence and the co-operation of the sales department in obtaining a fair profit; but more, much more, they can be made to picture the running situation, so that leaks and losses are shown and points of improvement developed, so as to bring about cost reduction. But how?

Showing Leaks.

Four Main Elements of Factory Life.

Consider the factory life divided into four main elements:

1. *Raw Material*, meaning all and only that material which becomes a part of the finished and salable article.

2. *Productive Labor*, meaning all and only that labor actually shaping up the finished article.

3. *Factory Expense*, meaning all money spent in keeping this productive labor active and to its best efficiency.

4. *Selling Expense*, meaning all money spent in disposing of the goods.

Considering now these four elements, we can put together in a simple way—and prove the facts through the bookkeeping—a cost system showing the cost of the finished article; but better even than that, we can put together a cost system that will give the manager control of the factory situation and bring about sure economy, since it will show

Factory Control.

PAYROLL REVIEW

	WEEK OF April 4.	WEEK OF April 11	WEEK
Wages Total Shop	1033.55	1956.16	
Productive Labor	1917.65	1765.91	
Non-Prod. "	$15.19	$190.25	
% " "	24.9%	28%	
Piece Work Prod. Labor	615.35	412.25	
Day " " "	902.81	980.66	
% Piece Work	40.5%	30.4%	
DEPARTMENT 1			
Total Wages	498.19	476.10	
Productive Labor	370.00	390.00	
Non-Prod. "	118.19	96.10	
% " "	23.9%	20.2%	
Piece Work Prod. Labor	200.00	200.00	
Day " " "	170.00	190.00	
% Piece Work	54%	51.5%	
DEPARTMENT 2			
Total Wages			

Fig. 3.—The data collected in this payroll review is obtained from time cards, &c., and affords a condensed though comprehensive view of all labor disbursements in every department. By comparing these figures for successive periods, the factory manager can keep watch of the important matters of nonproductive labor and piece work, and direct his efforts most intelligently toward reducing the former and increasing the percentage of the latter. For instance, in the upper table, referring to the shop, the per cent. of nonproductive labor is shown to have increased in successive weeks from 24.9 to 28 and the amount of piece work to have decreased from $615.22 to $412.25, or from 40.5 to 30.4 per cent. Both these changes are in the wrong direction and would cause the alert manager to make inquiries and institute corrective measures.

the progress and fluctuations in the four elements and in the departments of the plant.

Let us then tackle the proposition in its elements.

MATERIAL.

There are just two main points about material:

First: It should be bought as cheaply as desired quality will permit, which question I am not now going into.

Second: The wastes between the amount of raw material used and the finished product, and especially the bad work daily, should be known and kept to a minimum.

Checking Waste.

For the factory, then, the vital points regarding material are:

Out of a given quantity of material, how many good parts are obtained, and when does it happen that less than the right number is obtained?

Out of a given number of parts started, how many drop by the wayside, where do they drop, why do they drop and who drops them?

A right cost system answers the first question, as shown by Fig. 1, and the question of daily bad work is shown by Fig. 2. These forms, while not shown in utmost detail, are not in any sense theoretical, but are all in practical use, and a right method obtains them simply.

A Study of the Finished Cost Sheet.

Fig. 1, shows certain valuable points at a glance:

1. *We have the costs shown comparatively*—i. e., each successive lot is shown in close comparison, as to cost occurrence, with previous lots. This is a great economical point in all cost statistics. Facts, which in themselves may mean nothing, assume a large economical importance when placed beside other facts or similar occurrences in factory life, since they form the initiative action toward economies. As a matter of fact, the fluctuations in actual costs are generally much greater than shown here.

Eloquent Comparisons.

2. *The vital points of unit cost are brought out*, showing the cost per 100 each time in the various items of material and showing the per cent. of items which offers the practical man waste. It is the fluctuations of these levers that control the factory situation as to use and waste of his materials, instead of merely putting the material into use and progress and trusting to good oversight and that Providence, which, according to Dun's and Bradstreet's, only looks after 5 per cent. of business enterprises.

Study of Fluctuations.

Other Details Compiled.

This finished cost sheet, Fig. 1, also shows the labor operations and the factory and selling expense in sufficient detail and comparison of unit cost, and gives finally a comparison of net cost of finished articles with selling price. Fig. 2 shows in a daily record what, where and why work is spoiled, and to the practiced man offers a basis of correction of this loss.

The right cost system, then, gives the practical man knowledge of best quantities of parts to be gotten from a given amount of material, and when the standard is departed from, and gives him daily knowledge of bad material. The material cost is easily proven, and the knowledge of bad work daily is the greatest corrective possible for this large factory leak. In one factory of not so large a size, which I have in mind, this method of knowing wastes has proved to be easily worth $30,000 a year in savings. In many others it has not been hard to show big results.

Important Savings.

PRODUCTIVE LABOR.

In the second element, productive labor, we have an element that is a matter of constant struggle and interest to the factory man. The first necessity, from the system point of view, is to get the facts of the case. No better method can be used than to make the payroll show by departments, as per Fig. 3. Here we know of each department, and the payroll this is obtained from shows the same of each man, the fact whether working nonproductively or productively, and whether on piece work or day work. And these are all very vital points in profit making.

Getting at the Facts.

Reducing the Per Cent. of Nonproductive Labor.

The first struggle in control by the practical man is to keep down the per cent. of nonproductive labor. Many factories have too high a per cent. of nonproductive labor, and they don't realize it. They don't know how much they have. There is no way to get the knowledge definitely, except to know of each man, each week, how he has worked along these four lines. For economy and low costs, keep men working productively, and keep foremen helping to do this by having their department sheet to criticise them when they don't.

Keeping Track of Individuals.

Increasing the Proportion of Piece Work.

But even more so, if you want to control labor and make costs steady and easily kept, keep labor on piece work. Many factories think they have their labor on piece work, when the records show really only a very small percentage so working. They don't know how much is piece work, and they don't know how to get the rest on piece work and keep them there. There are many kinds of piece work successfully in operation to-day, other than the best known one of paying one man on just what he does—methods that are thoroughly successful where regular piece work is an impossibility.

Paying for What Is Done.

The Gang Piece Work Method,

where a whole gang, including even the foreman, is paid on the production turned out by the room, is in many cases very successful when no other plan will work. It invariably increases production, and in several factories I have in mind only the actually finished production, and no bad work, is paid for. At one operation alone, in one factory, this method of payment reduced the waste from 15 to 2 per cent. The method of

Fixing a Standard Production,

and paying a per cent. increase to a man or a gang when this standard is averaged to be beaten over a reasonable length of time, operates very well. I have in mind a case where on this basis the production has been increased, with the same gang and machines, 50 per cent.

The Question of Quality.

But another great difficulty in the minds of factory managers is that they are afraid of the question of quality. I make the claim, based on many years of piece work installation, with never a strike, that piece work betters quality when properly handled. We have, in fact, installed in some plants a piece work method which is tied up with the questions of quality and waste. I have in mind one factory where

Piece Work Betters Quality.

OPERATION COST OF PARTS

Head, Model B. Part 116.

DRILL AND TAP HOLES							PLANING							MILLING						
DATE 1909	WORKMAN'S NO.	GOOD PARTS	HOURS	RATE PER HOUR	COST PER PIECE	P.W. RATE PER HR.	DATE 1909	WORKMAN'S NO.	GOOD PARTS	HOURS	RATE PER HOUR	COST PER PIECE	P.W. RATE PER HR.	DATE 1909	WORKMAN'S NO.	GOOD PARTS	HOURS	RATE PER HOUR	COST PER PIECE	P.W. RATE PER HR.
1/10	169	40	5		.075	.30	1/9	169	15	5		.01	.15	1/10	107	10	3	.25	.075	
2/2	168	10	½		.075	.315	1/16	192	20	5		.02	.10	2/2	107	20	5	.25	.0625	
2/16	169	60	9½		.075	.333	2/21	192	10	4		.02	.10	2/16	107	10	2	.25	.050	

Fig. 4.—This table indicates the method of obtaining the labor operation cost of parts—in this case, "Head, Model B, Part No. 116"; also the cost of the different operations. Opportunities are thus afforded for valuable comparisons showing whether a piece price should be raised or lowered because of increased or decreased cost, whether the piece work rate is too high, as in the first operation, drilling and tapping holes, or too low, as in the planing operation. In the milling operation, which is done on day work, is brought out a great variation in cost, which should be investigated, the same workman turning out 10 good parts in 3 hr. on January 10 and the same number of parts in 2 hr. on February 16, the latter lot showing a reduction in cost of 50 per cent.

the piece work rate is dependent on the per cent. of waste, and this per cent. has dropped from 4½ to 2 per cent., saving over $20,000 a year since. In another factory a similar plan has materially bettered the quality where quality was dependent on workmanship.

Getting at Labor Cost.

Piece Work vs. Day Work.

But think how easy the labor cost is to gather on the piece work plan! Instead of having to keep track of it constantly, the labor cost is fixed in advance. All that is necessary is to make sure that just these rates are paid. But if the day work rate is held to, it is advisable to know by the operations what the different men are doing, and what the best records are. Fig. 4 illustrates this method. Little explanation is required here. This method shows very plainly for regulation what earning possibilities per hour lie in the piece work rates, and what the minimum costs per unit are of day work labor.

Both for cost purposes and factory control, then, it is an economical and advisable thing to keep the per cent. of nonproductive to productive labor at a minimum, and the per cent. of piece work at the maximum. I have seen plants where many of the departments had 100 per cent. piece work.

(To be continued.)

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM SHANER & GODFREY, Olean, N. Y., successors to Wilkinson & Shaner in the Hardware, Stove, Implement, Paint and Sporting Goods business.

FROM CHARLOTTESVILLE HARDWARE COMPANY, Charlottesville, Va., which was completely burned out recently.

AMONG THE HARDWARE TRADE.

The Love & Cobb Grain & Implement Company has engaged in the Grain, Seed and Implement business at Blessing, Texas.

The Oakmont Hardware Company, Oakmont, Pa., expects to move into its new two-story brick building about March 15, where it will carry a full line of Builders' and General Hardware.

The Blooming Grove Hardware Company, Blooming Grove, Texas, has incorporated with a capital of $10,000 to carry on a general retail Hardware and Implement business, the incorporators being F. N. Drane, J. M. Haskins, N. A. Smith and W. M. Ingram.

Button & Mumbrue, Unity, Wis., whose store was recently destroyed by fire, will start in business again about June 1.

J. D. Bruce & Son have purchased the Implement business of H. M. Hamilton, in Decatur, Ill.

The J. S. McWilliams & Sons Hardware Company, El Dorado, Ark., has incorporated with a capital stock of $25,000.

The Cooper & Newton Hardware Company has succeeded to the business of Mellon & Pinkerton, Corvallis, Ore.

M. B. Smith has bought out the business of H. F. Gadum, Shaw, Kan.

The Williamson Hardware Company has been incorporated in Kennebec, S. D., with a capital stock of $10,000, and will handle Shelf and Heavy Hardware, Stoves, Tinware, Housefurnishings, Agricultural Implements, Paints, Oils, Sporting and Athletic Goods and Furniture. A large sample machine house has recently been erected.

The Melton & Spivey Hardware Company, Bellevue, Texas, has incorporated with a capital stock of $10,000.

J. E. Stevens Hardware & Furniture Company has been incorporated in Coleman, Tex., with a capital stock of $30,000, succeeding J. E. Stevens & Son, with no change in management. The company handles Shelf and Heavy Hardware, Stoves, Tinware, Housefurnishings, Window Glass, Agricultural Implements, Sporting and Athletic Goods, &c.

Taylor & Bottorf, Colby, Kan., have been succeeded in the retail Hardware business by Taylor Brothers.

G. L. Davis has succeeded Davis & Merrit in Chanute, Kan., handling Shelf and Heavy Hardware, Stoves, Tinware, Housefurnishings, Agricultural Implements, Sporting Goods and Vehicles.

J. H. Hall has succeeded King & Hall, Scott's Bluff, Neb., handling Shelf Hardware, Stoves, Tinware and Housefurnishings.

The Rio Grande Hardware & Machinery Company, Mercedes, Texas, has been incorporated with a capital stock of $15,000.

Fockler & Martin have bought the Hardware business of the New Mercantile Company, Winona, Wash.

The J. B. Mullane Company, Sullivan, Ind., has had a bad fire, suffering almost a total loss.

W. H. Langston has sold out his interest in the Langston Hardware Company, Guymon, Okla. The members of the concern as now made up are E. T. Guymon, E. C. Langston, G. E. Ellison, R. B. Quinn and J. H. Lott.

The Rayner Hardware Company, Coldwater, Okla., is opening a new Hardware, Stove, Paint and Sporting Goods store.

The Weakley-Clingman Hardware Company, Brownwood, Texas, has been succeeded by Clingman-Timmins Hardware Company.

The Hardware firm of Detwiler Brothers, Aledo, Ill., has been incorporated under the name of Detwiler Brothers Hardware Company, with a capital stock of $25,000.

A new Hardware store has just been opened at Waterloo, Iowa, by W. A. Covell & Son, who, besides a regular line of Hardware, will carry Paints, Oils, Varnishes, Glass, &c. Mr. Covell was formerly in business in Janesville, Wis.

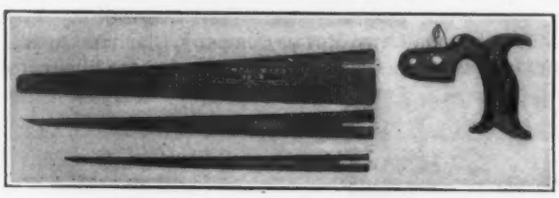
Spiral Wire Hoops.

The Pittsburgh Spiral Wire Hoop Company, Pittsburgh, Pa., is circulating a folder with blank form attached which may be torn off where perforated, filled out and sent to the company as an order for its spiral wire hoops. Full information is given as to how to order the proper size for any purpose. The hoops are designed to reinforce or take the place of wooden hoops on barrels, kegs, tubs, buckets, &c., for all purposes, and are said to be of much greater strength, since the torsional twist is added to the tensile strength of the wire. It is stated that the spiral form also exerts a grip, which will prevent slipping or loosening when the receptacle shrinks. Owing to the spiral form, the jointed ends can be perfectly interlocked without projecting points, forming a complete

smooth joint of the same diameter as the balance of the hoop, which cannot become unlocked and is referred to as the strongest part of the hoop. Owing to the rapid increase in strength arising from a slight advance in the size of wire, it is possible to make the hoop of any strength desired from the lightest suitable for the common water pail to the extra heavy required for tierces, hogsheads, &c.

Jennings' Nests of Saws.

C. E. Jennings & Co., 42 Murray street, New York, have just put on the market Jennings' nests of saws, Nos. 30 and 20, patent applied for, supplementing their other similar saw combinations, the new feature here being the Garland adjustable beech handle, and method of instantly inserting or removing the blades according to service required. The pivoted locking device and two brass screws are for securely gripping the heel of the saw, which is accomplished by throwing the lever forward and flush with the handle to lock the blades. The No. 30 set includes one 14-in. hack or metal cutting blade for cutting nails, wire, lead pipe, &c., encountered by plumbers, electricians and other workmen; one 14-in. compass blade and a 12-in. keyhole blade. The blades are made of finest grades of saw steel, and may be inserted either way for use in difficult places, according to the service required. The same description applies to the No. 20 set for general household use, except a 14-in. panel saw replaces the blade for cutting metals.



Jennings' Nest of Saws, No. 30.

Ideal Cornice Protector and Hoist.

James H. Marvin, 111 North Terrace avenue, Mount Vernon, N. Y., is putting on the market his patented Ideal cornice protector, Fig. 1 illustrating the article as marketed and Fig. 2 showing the application. It is designed for the protection of roof cornices in the hoisting of heavy articles into different floors of buildings and is especially serviceable in connection with pianos, wardrobes, desks, safes, refrigerators, bathtubs and other cumbersome articles. The protective strip is made of 3-in. angle iron, 5 ft. long, which rests on the edge of the cornice. Riveted to this is a hold back of 1½ x ⅜ in. bar steel, at the apex of which is a ring through which to pass a rope to draw the protector backward close to the edge, the other end of the rope being fastened around a chimney or other suitable roof projection. A block and fall tackle is hooked into the ring at the end of the swing which hangs over the edge of cornice, the swing being made of ¾-in. round bar steel. The protector is said to be capable of sustaining the equivalent of 2 tons.

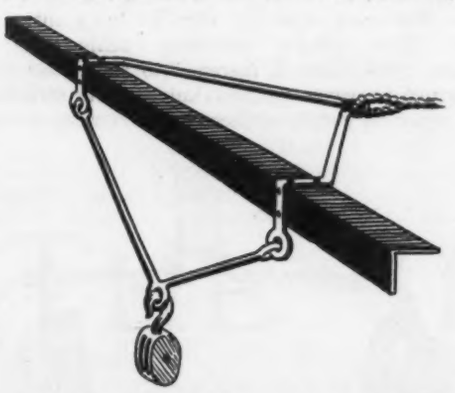


Fig. 1.—Ideal Cornice Protector and Hoist.

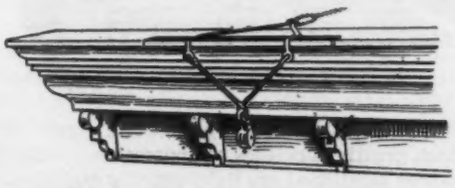


Fig. 2.—The Protector in Position.

Combination Pocket Knife.

Hibbard, Spencer, Bartlett & Co., Chicago, Ill., are introducing a novel pocket knife, as here shown. It is 3⅝ in. long, closed, and contains besides one large blade a screw driver, can opener and Harrison leather punch blade. The knife bears the name of the house and is unconditionally warranted. It is made in America, and all blades are of fine Wardlow's crucible cutlery steel, except the leather punch blade, which is made of high grade tool steel. The punch blade cuts a smooth round hole of any size desired, and is of other practical utility. The handle scales are genuine stag, brass lined with German silver, bolster and shield. The large blade is crocus polished on one side. This combination of useful tools is designed to meet the requirements of a large class for pocket carrying.

Combination Pocket Knife.

Gillette Safety Razor in Pocket Case.

The Gillette Safety Razor Company, 18 Tremont street, Boston, Mass., has just added to its line of safety razors and shaving accessories the pocket style Gillette safety razor, here illustrated, which is made in 15 styles and finishes, retailing at from $5 to $7.50 each. A feature of this article is the compact form and the handsome appearance of razor, metal blade box and hinged metallic jewelers' case. The handle is now in one piece, separating from the guard in such manner that both guard and handle occupy much less space. The case is 4¼ x 2 x 7-16 in. in dimensions, lined with purple silk velvet and furnished in plain, basket, shell, flower and Empire pat-

Pocket Edition Gillette Safety Razor, Plain Metal Case.

terns, in triple silver, gun metal and gold plated cases. The cases, razors and blade boxes are plated to match. The sets are uniform in shape and size, differing only in ornamentation and finish. The box blade carrier contains 12 double cutting edge wafer blades, each separately sealed. The quality of the plating is such that the company guarantees it for 20 years. Each case is inclosed in a wine colored flannelette bag for protection at home or when carried.

The Peter's Double Acting Force Pump.

The pumps here illustrated are designed for pumping air or water into pressure tanks or for other purposes, and are made by the Peter's Pump Company, Kewanee, Ill. The pumps are built with two perpendicular barrels, one above and the other below the main cylinder; the upper one contains the outlet valve and the lower one the suction valve. By reason of this form of construction, the water and air travel upward in a direct course and without the friction incident to indirect travel. The pumps have 3-in. brass lined cylinders and 5-in. stroke, and are tapped for suction on both sides so that connection can be made with either side without re-

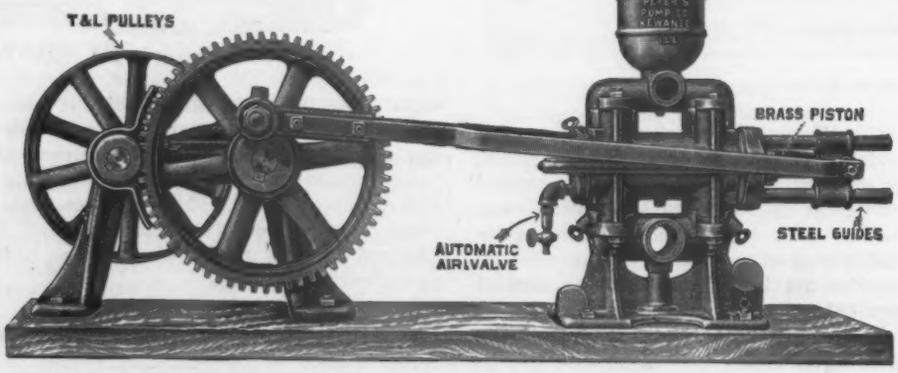


Fig. 1.—Peter's Double Acting Force Pump Arranged for Belt Driving as from Gasoline Engine or Electric Motor.

fitting. Fig. 1 shows an inexpensive power rigging for driving with a gasoline engine or electric motor. This equipment is very simple, durable and efficient, and is well adapted for use in connection with pneumatic

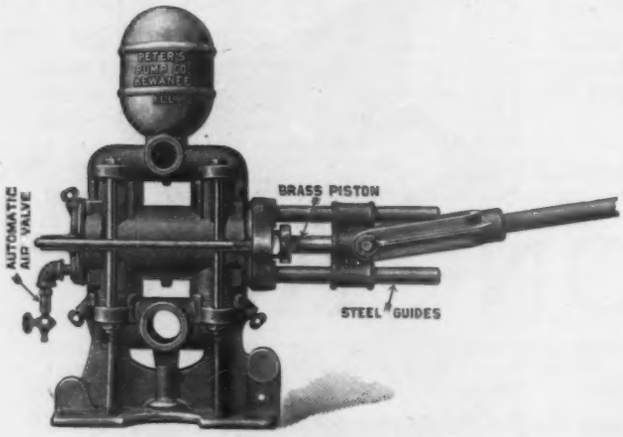


Fig. 2.—Peter's Pump Fitted with Stub Pittman.

pressure tanks; it is also convenient for other service when no mechanical power is available, as it is fitted with handle for hand operation. If driven by an electric motor, it is recommended that one of low speed, not over 800 rev. per min., be selected. The weight of this pump is 175 lb. Fig. 2 represents the same pump fitted with stub pittman.

Center Gauge Attachment.

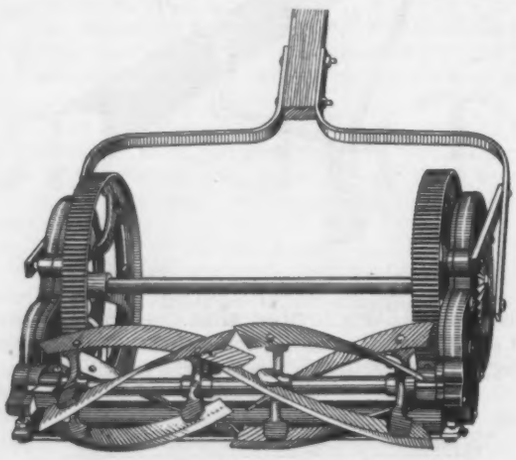
The L. S. Starrett Company, Athol, Mass., and 132 Liberty street, New York, has put out the center gauge attachment, No. 392, here illustrated. The device is a V block with a slot above the V containing a flat spring to frictionally hold the center gauge parallel with the block. Placing the V block against a lathe spindle or face plate, a threading tool may be adjusted perfectly to

Starrett's Center Gauge Attachment, No. 392.

cut both sides of a thread to the proper angle, eliminating uncertainty for both external and internal work. The attachment is adaptable to hold the gauges either by the side or end for testing work.

Clarinda Lawn Mower.

The Clarinda Lawn Mower Company, Clarinda, Iowa, is manufacturing the Clarinda lawn mower, here illustrated. The reel is divided in the center and so arranged that each set of four knives cut toward the center, thereby eliminating side draft. This principle permits nearly double the twist in the blades, which are given a helical curve. The reel running clearly in front admits of the drive wheels following behind on the cut grass. The roller is fastened to the under cutting knife, which prevents the reel knives from striking the ground when on rough surfaces or in mowing a terrace.

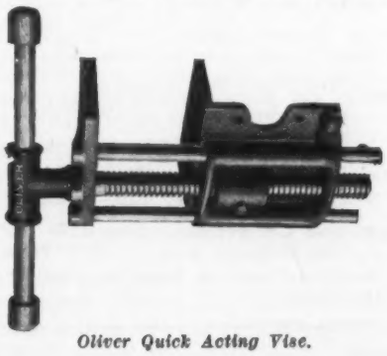


Clarinda Divided Reel Lawn Mower.

The adjustment is effected by a single screw on each side, which greatly simplifies the operation. Other favorable features mentioned are light running qualities, owing to the divided reel, mowing close to trees, buildings, flower beds, or other obstructions, and that it will cut grass so high that the preliminary use of scythe or sickle is unnecessary.

Oliver Quick Acting Vises.

The Oliver Machinery Company, Grand Rapids, Mich., has added to its output a new line of quick acting vises,



Oliver Quick Acting Vise.

Nos. 150-153, inclusive, an example of which is shown herewith. They are described as low priced, but are said to be powerful and well finished and easy to operate, and are recommended for educational institutions, pattern shops and woodworkers in general. The steel screw is 1⅛ in. in diameter, and has buttress thread which insures smooth action. The guides are steel and of ¾ in. diameter. The nut is solid bronze. All of the other parts are iron, except the T handle, which is malleable iron. The back jaw is screwed to the bench and supports, from its farthest end, all of the remaining parts of the vise on 5-16 in. steel trunnions. The bronze nut is underneath the screw and is pocketed under the back jaw. Nos. 152 and 153 have an adjustable brass bench stop on the front jaw for clamping work against bench stops on top of the bench. To get quick action it is only necessary to lift the screw to free it from contact with the nut. Then the front jaw may be pushed in or out with ease. At any position the front jaw may be released and the screw at once drops into the nut and engages.

The Baird Hardware Company, Charleston, W. Va., has purchased a lot 40 x 150 ft. nearly across the street from its present location and will in the near future erect an up to date building suitable for the accommodation of its business.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	℔ gal. 5 bbl. lots.
Linseed, Western, Raw	.55 @56
State, Raw	.55 @56
City, Raw	.56 @57
Boiled, 1¢ ℔ gal. advance on Raw.	
Raw, Calcutta, in bbls	.75 @..
Lard, Prime, Winter	.80 @81
Extra No. 1	.52 @53
No. 1	.47 @49
Cotton-seed, Crude, f.o.b. mill	.34 @34½
Summer, Yellow, prime	5.60@5.65
Summer, White	5.90@6.10
Yellow, Winter	5.95@6.05
Tallow, Acidless	.56 @..
Menhaden, Brown, Strained	.33 @34
Northern Crude	@..
Southern	.23 @24
Light Strained	.33 @34
Bleached Winter	.36 @..
Cocoanut, Ceylon	℔ lb 6.90@..
Cochin	℔ lb 7.00@..
Cod, Domestic, Prime	.38 @..
Newfoundland	.40 @..
Red Elaine	.43 @47
Saponified	℔ lb 5¾@ 6¾
Olive, Yellow	1.40@1.60
Neatsfoot, Prime	.55 @56
Palm, Lagos	℔ lb 5¾@ 5¾

Mineral Oils—

	℔ gal.
Black, 29 gravity, 25@30 cold test	.13 @13½
29 gravity, 15 cold test	13¼@14
Summer	12½@13
Cylinder, light filtered	20½@21
Dark, filtered	.18 @19
Paraffine, 903-907 sp. gravity	14½@15
903 sp. gravity	13½@14
883 sp. gravity	.11 @11½
Red	13½@14

Miscellaneous—

Barytes:	
White, Foreign	℔ ton $18.50@20.50
Amer., floated	℔ ton 17.00@18.00
Off color	℔ ton 12.50@15.00
Chalk in bulk	℔ ton 3.00@ 3.40
China Clay, Imported	℔ ton 11.50@18.00
Cobalt, Oxide	℔ 100 lb 1.45@ 2.60
Whiting, Commercial	℔ 100 lb 45@50
Gilders	℔ 100 lb .52@ .64
Ex. Gilders	℔ 100 lb .56@ .68

Putty, Commercial—℔ 100 lb

In bladders	$1.70@2.00
In bbls. or tubs, 100 lb	1.20@1.45
In 1 lb to 5 lb tins	2.65@3.25
In 12½ to 50 lb tins	1.50@1.90

Spirits Turpentine—℔ gal.

In Machine bbls	41½@42
In Oil bbls	41 @41½

Glue—

	℔ lb
Cabinet	.12 @15
Common Bone	7½@ 9
Extra White	.18 @24
Fish, liquid, 50 gal. bbls., per gallon	.60 @1.20
Foot Stock, White	.12 @14
Foot Stock, Brown	.9 @11
German Common Hide	.10 @12
German Hide	.12 @18
French	.10 @40
Irish	.13 @16
Low Grade	.10 @12
Medium White	.14 @19

Gum Shellac—

	℔ lb
Bleached, Commercial	@17
Bone Dry	@22
Button	.20 @30
Diamond I	.29 @30
Fine Orange	.23 @24
A. C. Garnet	.16 @16½
G. A. L. Garnet	.15 @16
Kala Button	.12 @13
D. C	.29 @30
Octagon B	.23 @24
T. N	.15 @16
V. S. O	.27 @28

Colors in Oil—

	℔ lb
Black, Lampblack	.12 @14
Blue, Chinese	.36 @46
Blue, Prussian	.32 @36
Blue, Ultramarine	.13 @16
Brown, Vandyke	.11 @14
Green, Chrome	.12 @16
Green, Paris	@24
Sienna, Raw	.12 @15
Sienna, Burnt	.12 @15
Umber, Raw	.11 @14
Umber, Burnt	.11 @14

White and Red, Lead &c.—

	℔ lb
Lead, English white, in Oil	10½@10¾
Lead, American White:	
Dry and in Oil, 100, 250 and 500 lb kegs	6¾
Dry and in Oil, 25 and 50 lb kegs	7
Dry and in Oil, 12½ lb kegs	7¼
In Oil, 25 lb tin pails	7¼
In Oil, 12½ lb tin pails	7¾
In Oil, 1, 2, 3 and 5 lb tin cans, ass't	8¾
Red Lead and Litharge:	
In 100 lb kegs	7
In 25 and 50 lb kegs	7¼
In 12½ lb kegs	7½
In lots of less than 500 lbs, ¼¢ ℔ lb advance over above prices of White and Red Lead and Litharge.	
Lead, American. Terms: On lots of 500 lbs and over, 60 days, or 2% for cash if paid in 15 days from date of invoice.	

Zinc, Dry—

	℔ lb
American, dry	5¼@ 5¾
Red Seal (French process)	6¾@ 7
Green Seal	7¼@ 7½
German Red Seal (French process)	7 @7¼
Green Seal	7½@ 7¾
White Seal	8¼@ 9
French, Red Seal	8¾@ 8¾
Green Seal	10¾@10¾

Dry Colors—

	℔ lb
Black, Carbon	9½@10
Black Drop, American	3½@ 8
Black Drop, English	.5 @15
Black, Ivory	.18 @20
Lamp, commercial	.4 @ 6
Blue, Celestial	.4 @ 6
Blue, Chinese	.30 @31
Blue, Prussian, Domestic	.28 @30
Blue, Ultramarine	.5 @15
Brown, Spanish	½@ 1
Carmine, No. 40	$3.00@3.10
Green, Chrome, ordinary	3½@ 5
Green, Chrome, pure	.17 @25
Ocher, American	℔ ton $12.00@15.00
American Golden	.4 @ 5
French	1¾@ 2
Foreign Golden	.3 @ 4
Orange Mineral, English	.10 @12
French	12¾@13
German	.12 @13
American	8½@10
Red, Indian, English	.5 @ 7
American	.3 @ 3¼
Red, Turkey, English	.4 @10
Red, Tuscan, English	.7 @10
Red, Venetian, Amer.	℔ 100 lb $0.75@1.50
English	℔ 100 lb $1.15@1.00
Sienna, Italian, Burnt and Powdered	.3 @ 9
Italian, Raw, Powdered	.3 @ 7
American, Raw	.2¼@ 3
American Burnt and Pow'd	.2¼@ 3
Talc, French	℔ ton $18.00@25.00
American	℔ ton 15.00@25.00
Terra Alba, French	℔ 100 lb .80@1.00
English	℔ 100 lb .90@1.00
American	℔ 100 lb, No. 1, .75@ .80
American	℔ 100 lb, No. 2, .60@ .65
Umber, T'key, Bnt. & Pow.	2¾@ 3
Turkey, Raw and Powdered	2¾@ 3
Burnt, American	2 @2½
Raw, American	2 @ 2½
Yellow, Chrome, Pure	12¾@14
Oxide Red, American	2 @ 7½
Vermilion, English, Imported	@70
Chinese	$0.90@1.00

THE IRON AGE

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

ISSUED EVERY THURSDAY MORNING.

Subscription, postpaid, $5 00 a year.

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ADVERTISING RATES ON APPLICATION.

New York (Main Office)	14-16 Park Place,	DAVID WILLIAMS CO., Pub.
Philadelphia,	Real Estate Trust Co. Bldg., Broad and Chestnut Sts.,	S. S. RECKEFUS, Manager.
Pittsburgh,	Park Building, 357 Fifth Avenue,	ROBERT A. WALKER, Manager.
Chicago,	Fisher Building, Dearborn and Van Buren Streets.	A. A. AINSWORTH, Manager.
Cincinnati,	Pickering Building, Fifth and Main Streets,	HENRY SMITH, Manager.
Boston,	Compton Building, 161 Devonshire Street,	WALTER C. ENGLISH, Manager.
Cleveland,	The Cuyahoga, 311 Superior Street,	EZRA S. ADAMS, Manager.

Remittances should be made by Draft, payable to the order of DAVID WILLIAMS COMPANY on any banking house in the United States or Europe, or by Post Office, Bank or Express Money Order on New York. When those cannot be obtained, postage stamps of any country will be received.

Newsdealers or Booksellers in any part of the world may obtain *The Iron Age* through the American News Company, New York, U. S. A. The International News Company, New York, U. S. A., and London, England; or the San Francisco News Company, San Francisco, Cal., U. S. A.

ENTERED AT THE POST OFFICE, NEW YORK, AS SECOND CLASS MATTER.

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are usually given to larger buyers.

Special Goods.—Quotations printed in small type (Roman) relate to goods of particular manufacturers, who request the publication of the prices named and are responsible for their correctness. They usually represent the prices to the small trade, lower prices being generally obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued annually, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—
Columbian and Domestic....33⅓%
North's 10%
Upson's Patent, ₱ gro., $29.90....10%
Zimmerman's—See Fasteners, Blind.

Window Stop—
Ives' Patent....10%
Ives' Stop Bead Screws and Washers....10%
Taplin's Perfection....10%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti-Rattlers—
Fernald Mfg. Co. Burton Anti-Rattlers, ₱ doz. pairs, Nos. 1, $0.75; 2, $0.60; 4, $1.00; 5, $0.50.
Fernald Quick Shifter, ₱ doz. pairs....$2.00@$3.00

Anvils—American—
Eagle Anvils....₱ lb @0 ¢
Hay-Budden, Wrought....9¼@9¾¢
Trenton....₱ lb 9½@9¾¢

Imported—
Swedish Solid Steel Paragon, ₱ lb....15@10½¢
Swedish Solid Steel Sisco, Superior, ₱ lb....10@10½¢
Peter Wright & Sons, ₱ lb, 84 to 319 lb, 11¢; 350 to 600 lb, 11½¢.

Anvil, Vice and Drill—
Millers Falls Co., $18.00....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—
Livingston Nail Co....10%

Augers and Bits—
Com. Double Spur....30%
Jennings' Patn., Bright.65&10@70%
Black Lip or Blued...65@65&5%
Boring Mach. Augers....70%
Car Bits, 12-in. twist....40&10%
Ford's Auger and Car Bits....40&5%
Ft. Washington Auger Co., Conard's....35%
Forstner Pat. Auger Bits....25%
C. E. Jennings & Co.:
No. 10 ext, lip. R, Jennings' list, 25&7½%
No. 30, R. Jennings' list....50%
Russell Jennings'....25&15&2½%
L'Hommedieu Car Bits....15%
Mayhew's Countersink Bits....45%
Pugh's Black....20%
Pugh's Jennings' Pattern....35%
Snell's Auger Bits....40%
Snell's Bell Hangers' Bits....40%
Snell's Car Bits, 12-in. twist....40%
Snell's King Auger Bits....50%
Swan's ....65&10&7½%
Swan's, Jennings' Pattern....50%
Wright's Jennings' Bits....50%

Bit Stock Drills—
See *Drills, Twist.*

Expansive Bits—
Clark's Pattern, No. 1, ₱ doz., $28; No. 2, $18....60&10%
Ford's, Clark's Pattern...60&5&60&10%
C. E. Jennings & Co., Steer's Pat...25%
Lavigne Pat., small size, $18.00; large size, $26.00....60&10%
Swan's 60%

Gimlet Bits—
Per gro.
Common Dbl. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—
Bonney Pat., per doz..$5.50@6.00
Ames ....20&10%
Universal 20%

Ship Augers and Bits—
Ship Augers....40&10@—%
Ford's ....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 6%
Watrous' ....33⅓&7½%
Snell's 40%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—
Brad Awls:
Handled ....gro. $2.75@3.00
Unhdld, Shldered...gro.63@66¢
Unhandled, Patent..gro.60@70¢
Peg Awls:
Unhandled, Patent..gro. 31@31¢
Unhdld, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00
Elmore Tool Mfg. Co.:
Tinners' and Brad Awls....55&7½%
Scratch Awls....60%

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—
Single Bit, base weights: Per doz.
First Quality....$4.75@5.00
Second Quality....$4.25@4.50
Double Bit, base weights:
First Quality....$7.00@7.50
Second Quality....$6.50@6.75

Axle Grease—
See *Grease, Axle.*

Axles—
Iron or Steel.
Concord, Loose Collar...4¼@4½¢
Concord, Solid Collar....4½@5 ¢
No. 1 Common, Loose...3½@4 ¢
No. 1½ Com., New Style..4¼@4¾¢
No. 2 Solid Collar....4¼@4¾¢
Half Patent:
Nos. 7, 8, 11 and 12....70%
Nos. 13 to 14....70%
Nos. 15 to 18...70&10@70&10&5%
Nos. 19 to 22...70&10@70&10&5%

Boxes, Axles—
Common and Concord, not turned ....lb., 5@6¢
Common and Concord, turned, lb., 6@7¢
Half Patent....lb., 9½@10¢

Bait—Fishing—
Hendryx:
A Bait....20%
B Bait....25%
Competitor Bait....20&5%

Balances—Sash—
Caldwell new list....50&10%
Pullman ....50&10%

Spring—
Light Spring Balances..60@60&5%
Chatillon's:
Light Spg. Balances....50@50&10%
Straight Balances....40@40&10%
Circular Balances....50&10%
Large Dial....30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—
Steel Crowbars, 10 to 40 lb.... per lb., 2¼@2½¢

Towel—
No. 10 Ideal, Nickel Plate..₱ gro. $8.50

Beam, Scale—
Scale Beams....40%
Chattillon's No. 1....30%
Chatillon's No. 2....40%

Beaters, Carpet—
Holt-Lyon Co.:
No. 12 Wire Coppered ₱ doz, $0.80; Tinned $0.85
No. 11 Wire Coppered ₱ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned....₱ doz. $1.50

Beaters Egg—
Dover Stamping & Mfg. Co.:
Genuine Dover, per gro., No. 1, Tumbler Size, $1.50; No. 2, Family Size, $1.50; No. 3, Extra Family Size, $24.00; No. 4, Hotel Size, $30.00.
Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd. $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.

Bellows—
Blacksmith, Standard List:
Split Leather....60&10@65%
Grain Leather....50@50&10%

Net Prices

Hand—

Inch..	6	7	8	9	10
Doz..	$5.00	5.50	6.00	6.50	7.50

Molders—

Inch..	10	12	14	16
Doz..	$7.50	9.00	12.00	15.00

Bells—Cow—
Wrought Cow Bells....75%
Jersey ....75&10%
Texas Star....50%

Door—
Home, R. & E. Mfg. Co.'s....55&10%

Hand—
Polished, Brass....60@60&10%
White Metal....60@60&10%
Nickel Plated....50&10%
Swiss ....50&10%
Cone's Globe Hand Bells....33⅓@35%

Miscellaneous—
Farm Bells....lb., 2¼@2½¢
Church and School....60@60&10%

Belting—Leather—
First Quality, Ex. Hy., Strictly Short Lap....60&10%
Standard ....70&10@70&10&5%
Light Double....75&10%
Cut Leather Lacing....45@50%
Leather Lacing Sides, per sq. ft.25¢

Rubber—
Competition (Low Grade), 70&10@75%
Standard ....60&10@70%
Best Grades....40@50%

Bench Stops—
See *Stops, Bench*

Benders and Upsetters, Tire—
Green River Tire Benders and Upsetters 20%

Bicycle Goods—
John S. Leng's Son & Co.'s 1908 list:
Chain, Parts, Spokes....50%
Tubes 60%

Bits—
Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks Tackle—
Common Wooden....75@75&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
See also Machines, Hoisting.

Boards, Stove—
Paper and Wood Lined....55%
Embossed 55%

Boards, Wash—
See *Washboards.*

Bobs, Plumb—
Keuffel & Esser Co....33⅓&10%

Bolts Carriage, Machine, &c.—
Common Carriage (cut thread): ⅝ x 6 and smaller....75&10%
Larger and longer....70&10%
Common Carriage (rolled thread): ⅝ x 6, smaller and shorter, 75&10&5%
Phila. Eagle, $3.00 list...80@—%
Bolt Ends, with C. & T. Nuts, 70&10%
Machine (Cut Thread): ⅝ x 4 and smaller....75&10&5%
Larger and longer....70&10&5%

Door and Shutter—
Cast Iron Barrel, Japanned, Round Brass Knobs:

Inch	3	4	5	6	8
Per doz.	$0.30	.35	.45	.60	.80

Cast Iron Spring Foot, Jap'd:

Inch	6	8	10
Per doz.	$1.20	1.50	2.25

Cast Iron Chain, Flat, Japanned:

Inch	6	8	10
Per doz.	$1.00	1.40	1.65

Cast Iron Flat Shutter, Jap'd, Brass Knobs:

Inch	6	8	10
Per doz.	$0.75	.95	1.25

Wrought Barrel Japanned, 80&10@80&10&5%
Barrel Bronzed....60&10%
Spring ....70&10@70&10&10%
Shutter ....50&5@50&10&5%
Square Neck....75@75&10%
Square ....70&10&10@80%
Ives' Mortise....10%
Ives' Wrought Metal....10%

Expansion—
F. H. Evans' Crescent....40@60%
Richards Mfg. Co....55&10%
Star Expansion Bolt Co.:
Star, Lag Screw Type..60&10&5&2½%
Star, Wood Screw Type....40%
Star, Machine, Single Wedge....60%
Star, Machine, Double Wedge....60%
Steward & Romain Mfg. Co.:
Style No. 13, Double....60%
Style No. 1, Single....60%
Style No. 100, Dbl. Jaw, Single..55%
Lag Screw....66⅔%

Plow and Stove—
Plow ....65&5@70%
Stove ....85@85&5%

Tire—
Common Iron....80%
Norway Iron....80%
American Screw Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84 82½%
Bay State, list Dec. 28, '99....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Eclipse, list Dec. 28, '99....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99....80%
Norway Phila., list Oct. '84....80%
Eagle 82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99....80%
Phila., Eagle, list Oct. 16, 1884..82½%
Upson Nut Co.:
Tire Bolts....72½%

Borers, Bung—
Borers Bung, Ring, with Handle:

Inch	1¼	1½	1¾	2
Per doz.	$4.80	5.60	6.40	8.00
Inch			2¼	2½
Per doz.			$8.65	11.50

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each....25%

Boxes, Mitre—
C. E. Jennings & Co....25%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme ....15&10%
Perfection 40%
Seavey 45%

Braces—
Common Ball, American..$1.50@$1.75
Barber's ....50&10&10@60&10%
Fray's Genuine Spofford's....60%
Fray's No. 61, 166, 206, 614....50%
C. E. Jennings & Co....50&5%
Mayhew's Ratchet....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces....25&10%
P., S. & W. Co., Peck's Pat....60&10%

Brackets—
Wrought Steel....80@80&5%
Bradley Metal Clasp...80&10@80&10&5%
Griffin's Pressed Steel....75@75&10%
Griffin's Folding Brackets....70&10%
Stanley's Pressed Steel....80%
Stanley's Folding Brackets..70&10&5%
Taplin Victor Handy Egg Beater Bracket ....₱ doz. $1.50

Bright Wire Goods—
See *Wire and Wire Goods.*

Broilers—
Kilbourne Mfg. Co....75&20%
Wire Goods Co....75%

Buckets, Galvanized—
M'fr's list, price per gross.

	Quart..	10	12	14
Water, Light	$28.35	30.75	34.75	
Water, Ex. Hvy.	46.85	49.35	53.25	
Fire, Rd. Btm.	33.50	35.90	39.90	
Well	37.35	41.35	45.35	

10&7½&6&5%

Bull Rings—See *Rings, Bull.*

Butts—Brass—
Wrought, High List, Oct. 86, 06.65%
Cast Brass, Tiebout's....40&10%

Cast Iron—
Fast Joint, Broad....40&10@50%
Fast Joint, Narrow ...40&10@50%
Loose Joint....70&10&75%
Loose Pin....70&10&75%
Mayer's Hinges....70@70&5
Parliament Butts....70@70&5

Wrought Steel—
BRIGHT.
Light Narrow, Light Reversible ....75&5%
Reversible and Broad.75&10%
Loose Joint, Narrow, Light Inside Blind, &c....75%
Back Flaps, Table Chest.70%
BRONZED.
Light Narrow, Loose Pin..55%
Light, Loose Pin, Ball Tip.65%
Broad 55%

Extra, 5@—

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, net list; 1200, 15%; 200, 300, 900 ..... 30%
Hendryx Bronze: Series 700, 800 ..... 30%
Hendryx Enameled 35%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong, per 100 lb., $3.50@$3.85
Sharp, 1 prong, per 100 lb., $4.00@$4.35
Burke's, 1 pg. Blunt Toe, 3¾¢; 2 pg. Blunt Toe, 4¼¢; 1 pg. Sharp Toe, 4¼¢; 2 pg. Sharp, 4¾¢; Blunt Heel, 4¼¢; Sharp Heel ..... 4¾¢
Lautier, Blunt, 4@4¼¢; Sharp, 4½@4¾¢
Perkins', Blunt, ℔ lb, 3.65¢; Sharp, 4.15¢

Can Openers—See *Openers, Can.*

Caps, Percussion—

Eley's E. B. ..... .52@55¢
G. D ..... per M. 34@35¢
F. L. ..... per M. 40@42¢
G. E ..... per M. 48@50¢
Musket ..... per M. 62@63¢

Primers—

Berdan Primers, $2 per M. 20&5%
Primer Shells and Bullets. 15&10%
All other primers per M. $1.52@1.60

Carpet Stretchers—See *Stretchers, Carpet.*

Cartridges—

Blank Cartridges:
32 C. F., $5.50 ..... 10&5%
38 C. F., $7.00 ..... 10&5%
22 cal. Rim, $1.50 ..... 10&5%
32 cal. Rim, $2.75 ..... 10&5%
B. B. Caps, Con. Ball, Swgd. $1.90
B. B. Caps, Round Ball $1.40
Central Fire 25%
Target and Sporting Rifle. 15&5%
Primed Shells and Bullets. 15&10%
Rim Fire, Sporting 50%
Rim Fire, Military ..... 15&5%

Casters—

Bed ..... 65&10@70%
Plate ..... 60@60&5%
Philadelphia ..... 70&10@75%
Acme, Ball Bearing 35%
Gem (Roller Bearing) ..... 70&10&10&5%
Steel Gem (Roller Bearing) 70%
Standard Ball Bearing 45%
Yale (Double Wheel) low list ... 40&10%

Cattle Leaders—See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:

3-16	¼	5-16	⅜	½	⅝
$7.45	4.80	3.85	3.25	3.10	3.00

¾-⅞-1 1⅛ to 1¼ inch.
$2.90 3.00
Lower prices in cask lots f.o.b. factory.
German Coil ..... 70&5%
German Pattern Coil:
6-0 to 1 ..... 70&10&5%
2 and 3 ..... 60&10&10@70%
4, 5 and 6 ..... 50&10@50&10&5%

Halter—

Halter Chains ..... 60&5@60&10%
German Pattern Halter Chains, list July 24, '97 ..... 70&5%
Covert Mfg. Co.:
Halter ..... 35&5%

Cow Ties—See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, Straight, with ring. $26.00
6½—6-2, Straight, with ring. $27.00
6½—8-2, Straight, with ring. $30.00
6½—10-2, Straight, with ring. $35.00
NOTE.—Add 2c per pair for Hooks Twist Traces; add per pair for Nos. 2 and 3, 2c; No. 1, 3c; No. 0, 4c to price of Straight Link.
Eastern Standard Traces, Wagon Chain, &c. 70%

Miscellaneous—

Jack Chain, list July 10, '93: Iron ..... 60&10&5@60&10&10%
Brass 65%
Safety and Plumbers' Chain. 75%
Gal. Pump Chain ..... lb., 4½@5%
Bridgeport Chain Co.:
Triumph Halter and Cow Tie ..... 35&2½@40%
Triumph Dog ..... 50&10@60%
Brown Halter and Coil ..... 50&5%
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion 40%
Oneida Community:
American Halter, Dog and Kennel Chains ..... 35&2½@40%
Niagara Dog Leads and Kennel Chains ..... 45@50&5%
Wire Goods Co.:
Dog Chain 70%
Universal Dbl.-Jointed Chain 70%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain 60%
Pullman:
Bronze Chain, 60%; Steel Chain, Coppered ..... 60&10%
Sash Chain Attachments, per set. .8¢
Aluminoy Sash Ribbon, per 100 ft. ..... $2.00@$5.00
Sash Ribbon Attachments, per set. .8¢

Chalk—

Carpenters' Blue ... gro., 50@55¢
Carpenters' Red ... gro., 50@55¢
Carpenters' White ... gro., 40@45¢

Checks, Door—

Bardsley's 45%
Pullman, per gro. $54.00
Russwin 33⅓%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools 55%
Youths' Chests, with Tools 40%
Gentlemen's Chests, with Tools. 30%
Farmers', Carpenters, etc., Chests, with Tools 20%
Machinists' and Pipe Fitters' Chests, Empty 45%
Tool Cabinets 45%
C. E. Jennings & Co.'s Machinists' Tool Chests 7½%

Chisels—

Socket Framing and Firmer

Standard List. .80&10@80&10&10%
Buck Bros. 30%
C. E. Jennings & Co.:
Socket Firmer No. 10 ..... 25&7½%
Socket Framing No. 15 ..... 25&7½%
Swan's ..... 66⅔@70%
L. & I. J. White & Co. ..... 30@30&5%

Tanged—

Tanged Firmers ..... .30&5@35%
Buck Bros. 30%
C. E. Jennings & Co. Nos. 191, 181. .25%
L. & I. J. White Co. ..... 25&5%

Cold— lb.

Cold Chisels, good quality. 13@15¢
Cold Chisels, fair quality. 11@12¢
Cold Chisels, ordinary .... 9@10¢
Elmore Tool Mfg. Co.:
Cold Chisels ..... 50&5%

Chucks—

Almond Drill Chucks 35%
Almond Turret Six-Tool Chuck 40%
Beach Pat. each $8.00 ..... 35&5%
Blacksmiths' 25%
Cincinnati Chuck Co.:
Independent 4-jaw Reversible 35%
Empire 25%
Jacobs' Drill Chucks 35%
Pratt's Positive Drive 25%
Skinner Lathe Chucks:
Independent 35%
Universal, Reversible Jaws 35%
Universal, Com. Style Jaws 40%
Combination, Reversible Jaws 35%
Combination, Com. Style Jaws ... 40%
Round Body or Box Body, 2 Chuck Jaws 25%
Geared Scroll Chucks 25%
Drill Chucks:
New Model, 25%; Geared Pattern, 25%; Skinner Patent, ... 25%
Positive Drive 40%
Planer Chucks 20%
Standard 45%
Drill Press Vises 30%
Face Plate Jaws 35%
Standard Tool Co.:
Improved Drill Chuck 45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21 ..... 35%
Scroll Combinations, Nos. 83 and 84 ..... 30%
Geared Scroll, Nos. 33, 34 and 35. 25%
Independent Iron, Nos. 18 and 318. 35%
Independent Steel, No. 64 ..... 25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104 ..... 35%
Union Czar Drill 25%
Universal, 11, 12, 16, 17, 13, 14, 15. 40%
Universal No. 42 ..... 35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50 ..... 35%
Steel Face Plate Jaws, Nos. 70 and 72 ..... 30%
Westcott Patent Chucks:
Lathe Chucks 50%
Little Giant Auxiliary Drill 50%
Little Giant Double Grip Drill ... 50%
Little Giant Drill, Improved 50%
Oneida Drill 50%
Scroll Combination Lathe 50%
Whitaker Mfg. Co.:
National Drill 25%

Clamps—

Carriage Makers', Star, P., S. & W. Co. 50%
Besly, Parallel ..... 33⅓&10%
Hammer & Co.:
Adjustable ..... 20&5%
Carriage Makers' H, P. Screw. 40&5%
Myers' Hay Rack 50%
Lineman's Swedish Neverturn 65%
Saw Clamps, see Vises, Saw Filers'

Cleaners, Drain,

Iwan's Champion, Adjustable 50%
Iwan's Champion, Stationary 40%

Sidewalk—

American Fork & Hoe Co.:
Star, ℔ doz., Socket, $4.00; Shank $3.50
Shank, ℔ doz., X 7½, $3.50; Shank, X 8 ..... $3.75

Cleavers, Butchers'—

Foster Bros. 30%
Fayette R. Plumb 30%
L. & I. J. White Co. 30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Co.:
1902 Chicago Horse, each .. $10.75
20th Century Horse, each ... $5.00
Lightning Belt Horse, each. $15.00
Chicago Belt Horse, each. $20.00
Stewart's Enclosed Gear Ball Bearing Horse, each $7.50
Stewart's New Model Sheep Shearing Machine, each. $12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each .. $9.75

Clips, Axle—

Regular Styles, list July 1, '05, 80&80&10%

Cloth and Netting, wire—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c 75%
Compression Bibbs 70%

Coffee Mills—See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list 40%
Leather, Walter B. Stevens & Son's list 40%

Compasses, Dividers, &c.

Ordinary Goods ..... .75@75&5%

Conductor Pipe,—

L. C. L. to Dealers:

	Gal. Steel.	Charcoal.	Copper.
Northeastern:			
70&10@—%	*50&10&7½%*		*50&10%*
Eastern:			
75@—%	*50&10&7½%*		*50&10%*
Central:			
75@—%	*60%*		*50&10%*
Northwestern:			
75@—%	*60%*		*50&10%*
Western:			
70&10@—%	*50&12½%*		*50&5%*
Tennessee:			
70&10@—%	*50&12½%*		*50&10%*
Southern:			
70&10@—%	*50&12½%*		*50&5%*
Southwestern:			
70@—%	*50&5%*		*50&5%*

Terms, 60 days: 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:

Gal.	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90
Galvanized, Lined, side handles, Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled 10%
Agate Lined 10%

Coppers' Tools—See *Tools, Coopers'.*

Coppers, Soldering—

Soldering Coppers, 3 lb. to pair and heavier, 21½¢; lighter than 3 lb. to pair ..... .23½¢

Cord— Sash—

Braided, Drab ..... lb. 35¢
Braided, White, Com., Nos. 8 to 12, 22¢; No. 7, 22½¢; No. 6, 23½¢. In lots of 12 doz. or over, 1 cent less per pound.
Cable Laid Italian, lb., No. 18. .37¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India ..... lb., 11@11½¢
Cotton Sash Cord, Tw'ted .18@20¢
Patent Russia ..... lb. ... 20¢
Cable Laid Russia ..... lb. ... 21¢
India Hemp, Br'd'd ..... lb. ... 21¢
India Hemp, Twisted ... lb. 13@14½¢
Patent India, Twisted .. lb. ... 17¢
Pearl Braided, cotton, No. 6, ℔ lb. 20½¢; No. 7, 19½¢; Nos. 8 to 12, 19½¢, in 12 doz. to 100 doz. lots.
Eddystone. Braided, Nos. 8 to 12, 26¢; 7, 26½; 6, 27½¢.
Harmony Cable Laid Italian, Nos. 7 to 10 ..... ℔ lb 23¢
Pullman:
Wire Sash Cord 10%
Sash Cord Attachments, per 100. $2.00
Samson, Nos. 8 to 12:
Braided, ℔ lb., Drab Cotton, 55¢; Italian Hemp, 40¢@50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord ..... 50¢ } 15%
Massachusetts, White ... ℔ lb 40¢
Massachusetts, Drab ... ℔ lb 45¢
Phoenix, White, Nos 8 to 12 .... 27¢
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen .... 57½¢
See also Chain and Ribbon.

Wire, Picture—

Full Length ..... .90@—%
Short Length ..... 30&20@—%
Hendryx Standard Wire Picture Cord ..... 90&10%
Turner & Stanton Co. Wire Picture Cord 90%

Cradles—

Grain ..... .50%

Crayons—

White Round Crayons, Cases, 100 gro., $8.00, $8.50, $9.00 and $10.00 according to grade.
Zelnicker's Lumber: ℔ gro. White and Purple, Indelible $7.50
Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black $4.50
Giant Lumber, 5¼ in. x 15-16 in. round, all colors, $12.00; Indelibles, $14.00; Blacks $10.00
Genuine Soapstone, Metal Workers', 5 in. x ¼ in. Round, $2.50; 5 in. x ¼ in. Square, $1.75; 5 x ½ x 3-16, $2.50; 5 x 1¼ x 3-16 ..... $3.00
Suremark, Black, $2.25; Blue, Red and Yellow $2.50

Crooks, Shepperds'—

American Fork & Hoe Co.:
Montana ..... ℔ doz. $4.50

Crow Bars—See *Bars, Crow.*

Cultivators—

American Fork & Hoe Co.:
Victor Garden ..... 50&10%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847. ℔ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor ..... ℔ doz. $3.00
Wm. Rogers & Son ..... ℔ doz. $2.50

Cutters— Glass—

H. H. Mayhew Co. 40%
Red Devil 60%
B. Mfg. Co. 40%
Woodward 50%

Meat and Food—

American 30%

Nos.	401	402	403	404	405	406	407
Each	$5	$7	$10	$12	$25	$50	$60

Enterprise:

Nos.	5	10	12	22	32
Each	$2	$3	$2.75	$4.50	$6

25@25&7½%
No. 292, $1.50 ..... 40&7½%
P., S. & W. Co.:
Ideal ..... 40@40&5%
Hales ..... 60&5%
Little Giant ..... ℔ doz. 40@50%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

New Triumph No. 605, ℔ doz. $24.00, 40%
Russwin Food, No. 1, $21.00; No. 2, $27.00; 3, $12.00 ..... 45&10&10%
$15.00 $18.00
Enterprise Beef Shavers ..... 25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw and Kraut Cutters 35%
Corn Graters 30%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife ... ℔ doz. $3.00
Combined Slaw Cutter and Corn Grater ..... ℔ doz. $4.00

Tobacco—

All Iron, Cheap ... doz, $1.25@4.50
Enterprise ..... 25@30%
National, ℔ doz., No. 1, $21; No. 2, $18 ..... 40%

Diggers, Post Hole, &c—

Disston's:
Rapid, ℔ doz., $24.00 ..... 25%
Samson, ℔ doz., $34.00 ..... 25%
Iwan's Pat. Post Hole and Well Auger 40%
Vaughan Pattern Post Hole Augers, ℔ doz., $7.00
Perfection Post Hole Diggers, ℔ doz. $8.50
Split Handle Post Hole Diggers, ℔ doz., $7.50
Hercules Pattern, ℔ doz. $9.50
Kobler's, ℔ doz., Universal, $14.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.50; Pioneer $7.50
Never-Break Crucible Steel Post Hole Diggers 60%

Dividers—See *Compasses.*

Drawing Knives—See *Knives, Drawing.*

Dressers Emery Wheel—

Sterling Emery Wheel Dressers 35%
Sterling Wheel Dresser Cutters 35%

Drills and Drill Stocks—

Blacksmith's Common Drilling Machines ..... .$1.50@1.75
Breast, Millers Falls ..... 15&10%
Breast, P., S. & W 33⅓%
C. & C. Ratchet 25%
Reversible Ratchet Die Stocks 25%
Goodell Automatic Drills. 50&10@60&10%
Millers Falls Automatic Drills, Graves', per doz., Nos. 1, $4.86; 2, $8.16.
Millers Falls Automatic Drills. 33⅓&10%
Ratchet, Curtis & Curtis 25%
Ratchet, Parker's 40%
Ratchet, Weston's 40%
Ratchet, Weston's, Style H Improved ..... 40@40&5%
Ratchet, No. 012 ..... 40@40&5%
Ratchet, Celebrated ..... 40@40&5%
Ratchet, Whitney's, P., S. & W. .. 40&10@50%
Whitney's Adjustable, No. 19, $12.00, 33⅓%

Twist Drills—

Bit Stock ..... .70@70&10%
Taper and Straight Shank, 65@65&10%

Drivers, Screw—

Screw D'ver Bits, per doz. .45@50¢
Balsey's Screw Holder and Driver, ℔ doz., 2½-in., $6; 4-in., $7.50; 6-in., $9 ..... 50%
Buck Bros.' Screw Driver Bits 30%
Champion 50%
Disston's Screw Drivers, Handles and Ferrules 70%
Elmore Tool Mfg. Co.:
Elmore 60%
Hartford 66⅔%
Indestructible ..... 55&7½%
Standard Neverturn 66⅔%
Star ..... 75&5%
Screw Driver Bits 25%
Fray's Hol. H'dle Sets, No. 3, $12. 50%
Ford's Brace Screw Drivers .... 40&10%
Gay's Double Action Ratchet 35%
Goodell's Auto ..... 65@65&10%
Mayhew's Black Handle 40%
Mayhew's Monarch 40%
Millers Falls, ℔ doz., Nos. 11, $9.95; 12, $13.73; 20, $8.17; 21, $8.46; 41, $13.43; 42, $17.21.
Swan's:
Nos. 7565 to 7568, 60%; No. 7540 ..... 40&10%

Eave Trough, Galvanized—

Territory.	*Gal. Steel.*	*Copper.*
Northeastern	*75&10&5%*	*50&10%*
Eastern	*80%*	*50&10%*
Central	*80&10&5%*	*50&10%*
Northwestern	*80&10&5%*	*50&10%*
Western	*80&5%*	*50&5%*
Tennessee	*80&5%*	*50&10%*
Southern	*75&10%*	*50&5%*
Southwestern	*75&10&2½%*	*50&5%*

Terms.—2% for cash. Factory shipments generally delivered.
Note.—Lower prices are quite general owing to market irregularities.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories: Galv. Steel, Galv. C. I. and Copper.
Sizes 2, 3, 4 ..... 80%
Sizes 1½, 2½, 3½, 5, 6 ... 60&10%
No. 26 ..... 50%
No. 24 ..... 25%
Copper Elbows 50%

Elbows, Stove Pipe—

Edwards, Standard Blue .... 40&10&10%
Edwards, Royal Blue ..... 40&10&10%
Reeves, Dover, Flat Crimp. 40&10&5%

Emery, Turkish—

	¼ to ½:	½ to 2:	Flour.
Kegs ..... lb.	*5 ¢*	*5¼¢*	*5¼¢*
½ Kegs ..... lb.	*5¼¢*	*5¼¢*	*5¼¢*
¼ Kegs ..... lb.	*5½¢*	*6 ¢*	*6 ¢*

10-lb. cans, 10 in case....6½¢ 7 ¢ 6 ¢
10-lb. cans, less than 10.....10 ¢ 10 ¢ 8 ¢
Less quantity..10 ¢ 10 ¢ 8 ¢
NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extensions, Bit—
Ford's Auger Bit Extensions....40&5%

Extractors, emon Juice—
—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's Jap'd and Galv., 50 & 5%; Bronze and Plated.....50%
Walling's 50%
Upson's Patent.....40%

Cord and Weight—
Ives, ₩ gro., $1.08.....10%
Titan, ₩ gro., $0.66.....10%

Corrugated—
Acme Corrugated Fasteners.....70%

Faucets—
Cork Lined.....50&10@60%
Metallic Key, Leather Lined, ..60&10@70%
Red Cedar.....40&5@40&10&5%
Petroleum .....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star 60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I.X.L. Cork Lined..50%
John Sommer's Reliable Cork Lined..50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined....50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
Self Measuring:
Enterprise, Self Measuring and Pump, ₩ doz., $36.00.....40&10%
Lane's, ₩ doz., $36.00.....40&10%
National Measuring, ₩ doz. $36.40&10%

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic—
List Nov. 1, 1899.
Best Brands.....70&10@75&10%
Standard Brands.....75&10@80%
Lower Grade....75&10&10@80&10%
Disston's Superfine.....60%
Gold Medal.....70%
McCaffrey's American Standard, 60&10&10%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97.....33⅓@40%

Fixtures, Fire Door—
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 .....$3.75
Fusible Links, No. 96.....50%
Expansion Bolts, No. 107.....60&10%

Grindstone—
Net Prices:

Inch	*.15*	*17*	*19*	*21*
Per doz.	*$3.60*	*3.85*	*4.15*	*4.65*

Peck, Stow & Wilcox Co.:

In.	15	17	19	21	24	
	$4.00	4.40	4.75	5.50	6.50	...30%

Reading Hardware Co.....60%

Fodder Squeezers—
See *Compressors.*

Forks—
American Fork & Hoe Co.:.....70&5%
Iowa Dig-Ezy Potato.....45&20&12½%
Hay, Regular, 3-tine.....60&7½&5%
Hay, Regular, 4-tine.....60&12½%
Champion, Hay.....60&20%
Acme, Hay.....65&5%
Manure, Regular, 4-tine.....70%
Manure, Regular, 5 and 6 tine.....65&5%
Champion, Manure.....70%
Columbia, Manure.....60&10&5%
Acme, 4-tine.....65%
Round Shoulder Header, 4-tine..65%
Champion, Header.....65%
Dakota, Header.....65%
Kansas Header.....35&5%
Wood, Barley.....66⅔%
Steel, Barley.....70&7½&5%
Columbia, Spading.....

Frames— Wood Saw—
White, S'g't Bar, per doz.75@80¢
Red, S'g't Bar, per doz.$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt.....	*1*	*2*	*3*	*4*	*6*
Each....	*$1.25*	*$1.60*	*$1.90*	*$2.20*	*$2.80*

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped..3.65
Waterproof Dbl. Taped..4.40
Waterproof Tpl. Taped..5.15
} 10&2½%

Gates, Molasses and Oil—
Stebbins' Pattern.....40@40&5%

Gauges—
Marking, Mortise, &c..50@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c.....50&50&10%
Disston's Marking, Mortise, &c.60&10%
Wire, Brown & Sharpe's.....33⅓%
Wire, Morse's.....25%
Wire, P., S. & W. Co.....33⅓%

Gimlets— Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $1.00; 2, $1.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $1.30; 2, $1.60

Glass, American Window
See *Trade Report.*

Glasses, Level—
Chapin-Stephens Co.....65@65&10%
Disston & Sons.....60&10%

Glue, Liquid Fish—
Bottles or Cans, with Brush, 25&10@50%
Elwell's 50%

Grease, Axle—
Common Grade...gro.$6.00@$6.50
Dixon's Everlasting, 10-lb. pails, ea. 85¢; in boxes, ₩ doz., 1 lb, $1.20; 2 lb.....$2.00
Helmet Hard Oil.....2%

Griddles, Soapstone—
Pike Mfg. Co.....33⅓@33⅓&10%

Grinders—
Pike Mfg. Co.:
Hand and Foot Power, Pyko Nos. 1, 2, 3; Pyko Primo; Pyko Peerless; Pyko Spiral (foot power).33⅓%
Mower Knife and Tool, $5.00..40&10%
Royal Mfg. Co.:
Hand and Foot Power, each, Nos. 01, $1.75; 1A, $2.50; 10, $5.00 .....33⅓%
Sickle Grinders, each, Nos. 20, $5.00; 20A, $6.00; 20A Combined, $6.50 .....40%
Disc Grinders, each, $2.50.....40%

Grindstones—
Pike Mfg. Co.:
Improved Family Grindstones, ₩ inch, ₩ doz., $2.00.....33⅓%
Richards Mfg. Co., Eli and Cycle, Ball Bearing, mounted.....40%

Grips, Nipple—
Perfect Nipple Grips.....40&10&2%

Halters and Ties—
Cow Ties.....70&10%
Bridgeport Chain Co.:
Triumph Coil and Halters.35&2½@40%
Brown Coil and Halters...45@50&5%
Brown Cow Ties.....50&5@50&10&5%
Brown Tie Outs.....70&10@75&5%
Covert Mfg. Co.:
Web .....30&2%
Jute Rope.....35%
Sisal Rope.....20%
Cotton Rope.....45%
Hemp Rope.....45%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Niagara Coil and Halters...45@50&5%
Niagara Cow Ties.....45&5@50&10&5%

Hammers—
Handled Hammers—
Heller's Machinists'....55&10@55&10&5%
Heller's Farriers.....40&5@40&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel.....40&10@50%
Farriers' .....40&10@50%
Riveting .....40&10@50%
Machinists' .....66⅔@5%
Blacksmiths' 50%
Elmore Shoemakers' Hammers.....75%
Fayatte R. Plumb:
A. E. Nail.....40&2½@40&12½%
Eng. and B. S. Hand.50&10&5@60&5%
Machinists' Hammers.....60&10&5%
Rivet and Tinners'.40&7½@40&12½&5%
Victor Magnetic Tack, ₩ gro....$7.75

Heavy Hammers and Sledges—
Under 3 lb., per lb., 50¢ ..80&10%
3 to 5 lb., per lb., 40¢...80&10&10%
Over 5 lb., per lb., 30¢.....
Over 5 lb., per lb., 30¢.80&10&10%

Handles—
Agricultural Tool Handles
Axe, Pick, &c....60&10@60&10&5%
Hoe, Rake, &c.....40%
Fork, Shovel, Spade, &c.:
Long Handles.....40%
D Handles.....40%

Cross-Cut Saw Handles—
Atkins' 40%
Disston's Handles and Saw Tabs..45%

Mechanics' Tool Handles—
Auger, assorted...gro.$1.00@$3.50
Brad Awl.....gro.$1.65@$1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65; Hickory.....$2.15@2.40
Socket Firming, Apple, $1.75@ $1.95; Hickory.....1.60@1.75
Socket Framing, Hickory, $1.60@$1.75
File, assorted.....gro.$1.30@$1.40
Hammer, Hatchet, &c.. 60&10@60&10&5%
Hand Saw, Varnished, doz., 80¢ 85¢; Not Varnished.....65@75¢
Plane Handles:
Jack, doz., 30¢; Fore, doz...45¢
Chapin-Stephens Co.:
Carving Tool.....30@30&10%
Chisel .....60@60&10%
File and Awl.....60@60&10%
Saw and Plane.....30@30&10%
Screw Driver.....30@30&10%
Millers Falls Adj. and Ratchet Auger Handles .....15&10%
Nicholson Simplicity File Handle .... ₩ gro. $0.85@$1.50
J. L. Osgood:
Indestructible File and Tool, ₩ gro., No. 1, $8.00; No. 2, $8.50; No. 3, $9.00; No. 4, $9.50; No. 5, $10.00.....gro. lots 10%
W. A. Zelnicker Supply Co.:
Hammer, ₩ doz., 12 in., $2.00; 14 in., $2.00; 16 in., $2.30; 18 12., $2.50; 20 in., $2.70; 22 in., $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80.
Sledge, ₩ doz., oval, 30 in., $3.80; octagon, 30 in., $3.80; oval, 36 in., $4.00; octagon, 36 in., $4.00.
Axe, ₩ doz., 28 to 34 in., $5.60; 36 in., $5.80.
Adze, ₩ doz., 36 in., $5,80; 36 in., $7.80.
Pick, ₩ doz., R. R., 36 in., $8.00; coal, 34 in., $5.80.
Hatchet, ₩ doz., 12 to 14 in., $2.00.
} 50%

Hangers—
NOTE.—Barn Door Hangers are generally quoted per pair, without track and Parlor Door Hangers per double set with track, &c.
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&10%
Roller Bearing.....70%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00..60&10%
Roller Bearing, No. 11, $15.00.. 60&10%
Roller Bearing, Ex. Hy., No. 22, $18.00.....60&10%
Bull Dog, $24.00.....70%
Lane Bros. Co.:
Parlor, Ball Bearing, $1.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion per set of 4 Hangers, complete with track.....$2.25
Barn Door, Standard.....60&10%
Hinged .....net $6.08
Covered .....60&5%
Special .....70&5%
Trolley Hangers and track...50%
Lawrence Bros.:
Cleveland .....70&7½%
Clipper, No. 75.....60%
Crown .....55&10%
Cyclone, No. 40.....net $6.50
Tandem, No. 50.....net $7.50
New York.....55&10%
Trolley, No. 30, ₩ pair.....$1.25
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2..70%
Anti-Friction 60%
Hinged Hangers, King Charm.60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track, No. 3..$2.25
Roller B'r'g St'l Track No. 12.$2.20
Roller B'r'g St'l Track No. 13.$2.50
Roller B'r'g, Nos. 39, 41, 43, 70&7½%
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16.....50&10%
Seal, Steel Track No. 8.....$2.25
Auto Adj. Track No. 22..50&5%
Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 150.....$2.50
Safety Underwriters F. D. No. 101 .....50%
Tandem No. 41..2½ and 3 60&10%
Palace, Adjustable Track No. 132 .....50&5%
Royal, Adjustable Track No. 122 .....50&10%
Ives' Wood Track No. 1.....$2.25
Trolley B. D. No. 20.....50&10%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28.....$1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2.70&7½%
Anti-friction, No. 42; No. 44, sizes 2½ and 3.....60%
Hinged Tandem No. 48....60&5%
Folding Door B. B. Swivel No. 135 .....40%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing, ₩ doz., 4 in., $12.00; 5 in., $14.00..40&10%
Myers' Stayon Hangers.....60%

Hangers— Garment—
Pullman Trouser, ₩ gro., No. 1 $9.00; No. 4, $24.00; No. 5, $16.50; No. 8, Black Enamel, $7.50; No. 10, $21.00; No. 12, $8.00; No. 15, Rods, $9.00; No. 18, Loops.....$10.00
Victor Folding.....₩ gro. $9.60

Gate—
Myers' Patent Gate Hangers, ₩ doz. net 50%

Joist and Timber—
Lane Bros. Co.....35%

Hasps—
Griffin's Security Hasp.....50&10%
McKinney's Perfect Hasp, ₩ doz..60%

Hatchets—
Regular list, first qual.50&10@60%
Second quality.....60@60&10%

Heaters, Carriage—
Clark, No. 5, $1.25; No. 5B, $1.50; No. 3, $1.75; No. 3D, $2.00; No. 7D, $2.25; No. 3E, $2.50; No. 1, $3.00.....25%
Clark Coal, ₩ doz., $0.75.....20%

Hinges—
Blind and Shutter Hinges
Surface Gravity Locking Blind: Doz. Sets with Fastenings, No. 1, $0.70; No. 3, $1.25; No. 5, $2.65.
Mortise Shutter.....80%
Mortise Reversible Shutter...80%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70&75%
Parker Wire Goods Co.
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00.....20%
Reading's Gravity.....60%
Stanley's Steel Gravity Blind Hinges, No. 1647½, ₩ doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&5%
Acme, Lull & Porter.....75%
Queen City Reversible.....75%
Shepard's Noiseless; Nos. 60, 65, 55 .....75&5%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&5%
Clark's O. P., No. 1.....75&10%
Clark's O. P., Nos. 3 and 5....75&5%
Tip Pat'n, No. 1.....75&10%
Clark's No. 3.....75&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....70&10&5%
Shepard's Double Locking.....75%
Champion Gravity Locking.....75&5%
Pioneer .....75&10%
Empire 65%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60&10%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L't'chs.	*$2.00*	*2.70*	*5.00*
Hinges only	*1.25*	*1.90*	*3.50*
Latches only	*.70*	*.75*	*.35*

New England:
With Latch.....doz..@$2.00
Without Latch.....doz..@$1.60
Reversible Self-Closing:
With Latch.....doz..@$1.75
Without Latch...doz. ...@$1.35
Western:
With Latch.....doz. $1.75
Without Latch.....doz..$1.15
Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3.....70%

Miscellaneous—
Griffin Mfg. Co., Fleur de Lis Surface Hinges, ₩ doz. prs.....$1.00

Pivot Hinges—
Bommer Bros. Pivot, Ball Bearing 50%
Lawson Mfg. Co, Matchless.....30%

Spring Hinges—
Holdback, Cast Iron...$6.75@$7.00
Non-Holdback, C'st Iron$6.50@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....40%
Bardsley's Patent Checking.33⅓%
Bommer Bros.:
Spring Butt Hinges.....40%
Surface Floor, Ball Bearing 40%
Mortise Floor, Ball Bearing.40%
Lavatory Hinges.....40%
Non-Holdback Screen Door, Nos. 2000 and 900.....40%
Holdback Screen Door, No. 999.....₩ gro, $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor.50%
Garden City Engine House...25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American 30%
Columbia, ₩ gr., No. 14, $9.00; No. 18.....$25.00
Columbia, Adj., No. 7, ₩ gr.$12.00
Gem, new list.....30%
Clover Leaf and Acorn, per gro. $12.00
Oxford, new list.....30%
Floor Spring Hinges.....65&10%
Columbian Steel.....65&10%
Lawson Mfg. Co.:
Matchless Spring Hinges.....30%
Matchless Jamb Hinges.....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....₩ gr. $9.00
Chief Ball Bearings Floor Hinge 50%
Ball Bearing Door.....25%
No. 177, Sheet Steel Holdb'k. ₩ gr. pr.....$9.00
Standard Mfg. Co.:
Champion Double Acting Door Hinge .....25&10&10%
Standard Double Acting Floor Hinge .....25&10&10%
Superior Spring Hinge Co.:
Superior Floor Hinges.....40%
Spring Hinges.....40%

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—
Strap and T Hinges, &c., list February 10, 1908:
Light Strap Hinges....65%
Heavy Strap Hinges....75%
Light T Hinges.....60%
Heavy T Hinges....40&10%
Extra Hvy. T Hinges.65&10%
Hinge Hasps.....40%
Cor. Heavy Strap.....75%
Cor. Ex. Heavy T...65&10%
} Extra, 5@

Screw Hook and Strap. { *6 to 12 in..lb. 3½¢* / *14 to 20 in..lb. 3¼¢* / *22 to 36 in..lb. 3 ¢*

Screw Hook and Eye:
⅜ to 1 inch.....lb. 8¼¢
⅝-inch .....lb. 7½¢
½-inch .....lb. 8½¢

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—
M'f'gr's list, price per gross:

Inch	*15*	*16*	*17*	*18*
Galv. Open	*$35*	*$39*	*$42*	*$46*
Jap. Open	*26*	*28*	*31*	*35*
Galv. Funnel	*43*	*48*	*52*	*56*
Jap. Funnel	*33*	*36*	*39*	*43*

10&7½&5%

Masons' Etc.
Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each $1.05
Steel Mortar, No. 158.....each $1.35

Hoes— Eye-

Scovil and Oval Pattern, 60&10@60&10&10%
Grub, list Feb. 23, 1899, 70&10@70&10&10%
D. & H. Scovil 27½%
Am. Fork & Hoe Co. (Scovil Pattern) ..... 60&5%

Handled—

Cronk's Weeding, No. 1, $2.00; No. 2, $2.50
Star Double Bit $2.50
American Fork & Hoe Co.:
Regular, Cotton ..... 75&10&5&2½%
Crescent, Cultivator ..... 75&2½%
Mattock, Senior 70%
Mattock, Junior 70%
Sprouting 50%
Tobacco, Harper's ..... 66⅔&15&10%
Warren ..... 55&10&10&5%
Ivanhoe ..... 65&15&10%
Cultivator, B B 6 ..... 70&10&10&5%
Cultivator, B B 6½ ..... 70&10&10&5%
Weeding, Acme ..... 72½&10&2½%
Scuffle, Lightning ..... 60&5%

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ₱ doz. $24.00 ..... 45&10%

Door—

Bardsley's, Iron, 40%; Brass and Bronze 25%
Empire 50%
Pullman 25%
Richards Mfg. Co.: No. 117, Ever-ready, 40%; Nos. 118, 119, Sure Grip 50%
Superior 40%

File and Tool—

Nicholson File Holders and File Handles ..... 33⅓@40%

Fruit Jar—

Triumph Fruit Jar Holder, ₱ gross, $18.00; ₱ doz. $2.00

Trace and Rein—

Fernald Double Trace Holder, ₱ doz. pairs $1.25
Dash Rein Holder, ₱ doz. $1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, 50%; German 33⅓%

Hooks—Cast Iron—

Bird Cage, Reading 40%
Clothes Line, Reading List 40%
Coat and Hat, Reading ..... 45&20%
Coat and Hat, Wrightsville ..... 60&5%
Harness, Reading List 40%

Wire—

Belt, Nos. 1 to 15 ..... 75&10@80%
Wire C. & H. Hooks .. 80@80&10%
Bradley Metal Clasp Wire, Coat and Hat, 75&10@80%; Ceiling .. 75&10@80%
Columbian Hdw. Co., Gem ..... 75&10%
Parker Wire Goods Co., King .. 75&10%
Wire Goods Co.:
Acme, 60&10%; Chief, 70&10%; Crown, 75%; Czar, 65&10%; V Brace, 75%; Czar Harness, 50%; Ceiling, 75%.

Wrought Iron—

Box, 6 in., per doz., $0.90; 8 in., $1.15.
Cotton ..... doz. $1.25@$1.50
Wrought Staples, Hooks, &c.— See Wrought Goods.

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, best, all sizes, per doz., $2.75@$3.00
Grass, common grades, all sizes, per doz. ..... $1.25@$1.50
Whiffletree ..... lb. 5¼@6¢
Hooks and Eyes:
Brass ..... 60@60&10%
Malleable Iron ..... 70@70&10%
Covert Mfg. Co. Gate and Scuttle Hooks 40%
Turner & Stanton Co. Cup and Shoulder ..... 85&10%
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition ..... ft. 6@6½¢
3-ply Guaranteed .... ft. 8½@9¢
4-ply Guaranteed .... ft. 9½@12¢
Cotton Garden, ¾-in., coupled:
Low Grade ..... ft. 8@ 9¢
Fair Quality ..... ft. 10@11¢

Irons— Sad—

From 4 to 10 ..... lb. 2½@2¾¢
B. B. Sad Irons ..... lb. 3¼@3½¢
Mrs. Potts', cents per set:

	Nos. 50	55	60	65
Jap'd Caps	86	93	96	93
Tin'd Caps	.91	88	1.01	98

New England Pressing .. lb. 3¾@4¢

Bar and Corner—

Richards Mfg. Co., Bar, 60&10%; Corner 60%

Pinking—

Pinking Irons ..... doz. 60@65¢

Irons, Soldering

See *Coppers.*

Jacks, Wagons—

Covert Mfg. Co.:
Auto Screw ..... 30&2%; Steel, 45%
Lockport 50%
Lane's Steel ..... 30&5%
Richards' Tiger Steel, No. 130 .. 50&10%
Smith & Hemenway Co.'s 25%

Ladder—

Richards Mfg. Co., Ladder Jacks .. 30%

Jointers—

Pike Mfg. Co., Saw Jointers, $7.00 .. 40%

Kettles—

Brass, Spun, Plain ..... 20@25%
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c. 30%
Wilkinson Shear & Cutlery Co. 60%

Corn—

Columbian Cutlery Co., Wilcut Braud Knives and Hooks 60%
American Fork & Hoe Co.:
Easy Cut, ₱ doz. No. 10 C H $2.10
Easy Cut, ₱ doz., No. 10 B C H. $2.20
Acme, ₱ doz. $2.35
Dent, ₱ doz. $2.35
Adjustable, Serrated, ₱ doz. $1.90
Serrated, ₱ doz. $1.85
Yankee, No. 1 C H $1.35
Yankee, No. 2 C H $1.15

Drawing—

Standard List ..... 80&10@—%
C. E. Jennings & Co., Nos. 45, 46, 25&7½%
Jennings & Griffin, Nos. 41, 42, 66⅔&7½%
Swan's ..... 66⅔@70%
Watrous 16⅔%
L. & I. J. White ..... 20&5@25%

Hay and Straw—

Serrated Edge, per doz. $5.00@5.50
Iwan's Sickle Edge ..... ₱ doz. $9.50
Iwan's Serrated ..... ₱ doz. $10.00

Miscellaneous—

Farriers' ..... doz. $2.60@3.55
Wostenholm's ..... ₱ doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch or Maple, Rubber Tip ..... gro. $1.25@1.40
Carriage, Jap., Drive, all sizes, gro. 35@40¢
Door, Mineral ..... doz. 65@70¢
Door, Por. Jap'd ..... doz. 70@75¢
Door, Por. Nickel .. doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c. 15%

Lacing, Leather—

See *Belting, Leather*

Ladders, Store, &c.—

Lane's Store 25%
Myers' Noiseless Store Ladders 50%
Richards Mfg. Co.:
Improved Noiseless, No. 112 ..... 50%
Climax Shelf, No. 113 ..... 50%
Trolley, No. 109 ..... 50%

Ladles, Melting—

L. & G. Mfg. Co., Melting and Plumbers' 25%
P., S. & W. ..... 40&10%
Reading 60%

Lamps,—

Hammer's M. I. Hand 45%

Lanterns—Tubular—

Regular, No. 0 ..... doz. $3.50@4.00
Side Lift, No. 0 .... doz. $4.00@4.50
Hinge Globe, No. 0. doz. $4.00@4.50
Other Styles ..... 40@40&10%

Bull's Eye Police—

3-inch ..... $3.75@4.00

Latches— Thumb—

Roggin's Latches, Jap'd, with Screws ..... doz. 35@40¢

Door—

Cronk & Carrier Mfg. Co., No. 101, ₱ doz. $2.00
Richards' Bull Dog, Heavy, No. 125 ..... 50&5%
Richards' Trump, No. 127 ..... $1.50

Leaders, Cattle—

Small ..... doz. 50¢; large, 60¢
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—

See *Pumps—*

Lifters, Transom—

R. & E. 10%

Lines—

Wire Clothes, Nos.	*18*	*19*	*20*
100 feet	*$2.30*	*1.95*	*1.75*
75 feet	*$1.95*	*1.65*	*1.50*

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3 .. 40%
Solid Braided Masons' 30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ..... ₱ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50 ..... 20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50 ..... 20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25 ..... 20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines 40%
Clothes Lines, White Cotton 20%
Shade Cord, Cotton or Linen 20%

Locks— Cabinet—

Cabinet Locks .... 33⅓@33⅓@5%

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co. 40%
R. & E. Mfg. Co. 10%

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass ..... 75&10%

Sash, &c.—

Ives' Patent:
Crescent 10%
Automatic Gravity Metal Sash, ₱ gro., $149.58 ..... 10%
Window Ventilating 10%
Pullman Patent Ventilating Lock .. 25%
Reading Sash Locks 40%
Taylor Mfg. Co., Perfect Ventilating, ₱ doz. ..... $0.75@$1.00

Machines—Boring—

Com. Upr't, without Augers, $2.00@2.25
Com. Angl'r, without Augers, $2.25@2.50
Ford Auger Bit Co. $22.00
Jennings', Nos. 1 and 4 ..... 25&7½%
Millers' Falls 5.75
Snell's, Upright, $2.65; Angular, $2.90
Swan's Improved ..... 40&10%

Corking—

Reisinger Invincible Hand Power ... ₱ doz. $18.00

Fence—

Williams' Fence Machines .... each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist. 30%
Moore's Hand Hoist, with Lock Brake 20%
Moore's Cyclone High Speed Chain Hoist 25%

Ice Cutting—

Chandler's 12½%

Washing

Boss Washing Machine Co.:	Per doz.
Boss No. 1	$57.00
Boss Rotary	57.00
Champion Rotary Banner No. 1	57.00
Standard Champion No. 1	50.00
Standard Perfection	27.00
Cincinnati Square Western	33.00
Uneeda American, Round	33.60

Mallets—

Hickory ..... 45&5@50%
Lignumvitæ ..... 45&5@50%
Tinners' Hickory and Applewood ..... doz. 45&5@50%

Mangers, Stable—

Swett Iron Works 50%

Mats, Door—

Acme Flexible Steel 50%
Elastic Steel (W. G. Co.), new list. 50%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.:
Coffee ..... 20@25%
Shell and Corn ..... 25&10%
National list Jan. 1, 1902 ..... 30%
Parker's Columbia and Victoria .. 33⅓%
Parker's Box and Side ..... 50&10%
Swift, Lane Bros. Co. 30%

Motors, Water—

Divine's Red Devil 30%

$2.50	3.50	10.00	15.00	33⅓%
No. 1.	2	3	4	

Lippincott's:

No.	1	2	3	4	
	$2.50	3.50	10.00	15.00	33⅓%

Pike Mfg. Co., Tool and Knife Grinding 33⅓%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest, 10-in., $2.00; advance 10¢ for each size.
Cheap, 10-in., $2.25; advance 15@20¢ for each size.
Better Grade, 10-in., $3.00; advance 25¢ for each size.

	12	*14*	*16*	*18-in.*
High Grade	*$4.50*	*4.75*	*5.00*	*5.25*

Continental 60%
Great American 70%
Great American Ball B'r'g, new list. 70%
Quaker City 70%
Pennsylvania 60%
Pennsylvania, Jr., Ball Bearing, 50&10&5%
Pennsylvania Golf 50%
Pennsylvania Horse ..... 33⅓&5%
Pennsylvania Pony ..... 40&5%

Nails—

Wire Nails and Brads, Miscellaneous ..... 85&5@85&10%
Cut and Wire, See *Trade Report.*
Hungarian, Finishing, Upholsterers', &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Anchor	23	21	20	19	18	.. ₱ lb. net, 12¢
Coleman	13	12	12	11	11	net ₱ lb
New Haven	23	21	20	19	18	.. ₱ lb. net, 12¢
Livingston	19	18	17	16	16	..... 10%

Western ..... ₱ lb 8¼¢
Jobbers' Special Brands, per lb. 9¢

Picture—

	1½	*2*	*2½*	*3 in.*
Brass Hd. gro.	*.45*	*.55*	*.60*	*.70*
Por. Head, gro.	*1.10*	*1.10*	*1.10*	

Upholsters—

Brass 30%
Plated ..... 30&10%

Nippers—

See *Pliers and Nippers.*

Nipples—

Standard Nipple Co.:
Wrought Pipe Nipples 80%

Nuts— *Blank or Tapped.*

Cold Punched:	*Off list.*
Square	*5.40¢*
Hexagon	*6.00¢*
Square, C., T. & R.	*5.80¢*
Hexagon, C., T. & R.	*6.60¢*
Hot Pressed:	Off list.
Square	*5.90¢*
Hexagon	*6.40¢*

Oakum—

Best ..... lb. 6½¢
U. S. Navy ..... lb. 6 ¢
Navy ..... lb. 5 ¢
Plumbers' Spun Oakum .. 2¾@3 ¢

Oil—

Pike Mfg. Co., Stonoil 40%

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated ..... 75&10%
Chase or Paragon:
Brass and Copper ..... 50&10%
Zinc ..... 65&10@70%
Railroad ..... 60&10&10%
American Tube & Stamping Co.:
Spring Bottom Cans ..... 70@70&10%
Railroad Oilers, &c. ..... 60@60&10%
Hero Fruit Jar Co.:
Spring Bottom Cans ..... 70@70&10%
Railroad Oilers, etc. ..... 60@60&10%
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 10%; Old Pattern, Nos. 1, 2, 3, 4, 50%.
Maple City Mfg. Co.:
Spring Bottom Cans ..... 70@70&10%
Railroad Oilers, &c. ..... 60@60&10%

Openers—Packing Box—

Herculever, ₱ doz., $24 ..... 30%

Can Openers—

	Per doz.
Sprague, Iron Handle	*30@35¢*
Sprague, Wood Handle	*40¢*
Sardine Scissors	*$1.75@3.00*

Can and Bottle Openers, ₱ doz., net: Yankee, $0.75@$0.85; Little Gem, $0.50@$0.65; Nifty $0.75

Egg—

Hartigan Nickel Plate, ₱ doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope, any quantity ..... 16@17¢

Rubber—

(Fair quality goods.)

	1	*2*	*3*	*4*	*5*
Nos.					
Per doz.	*$0.75*	*0.85*	*0.95*	*1.15*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz.	*$1.75*	*2.25*	*2.80*	*3.15*

Paper—Building Paper

Asbestos: lb.
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft. .. 2½¢
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft. ..... 3½¢
Mill Board, Sheet, 40 x 40 in., 1-32 to ½ in. ..... 3½¢
Per roll.
Rosin Sized Sheathing: 500 sq. ft.
Light weight, 25 lbs. to roll, 48@58¢
Medium weight, 30 lbs. to roll, 56@70¢
Heavy weight, 40 lbs. to roll, 75@78¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb., ton $54.50
Red Rope Roofing, 250 sq. ft. per roll $1.75

Tarred Paper—

1 ply (roll 400 sq. ft.), ton, $34.00@$38.00
2 ply, roll 108 sq. ft. ..... 65¢
3 ply, roll 108 sq. ft. ..... 88¢
Slater's Felt (roll 500 sq. ft.) .80¢

Sand Paper and Cloth—

Flint and Emery ..... 50&10%
Garnet Paper and Cloth 25%

Parers—Apple—

Goodell Co.:	
Family Bay State	₱ doz. $15.00
Improved Bay State	₱ doz. $36.00
New Lightning	₱ doz. $7.00
Turn Table '98	₱ doz. $4.00
White Mountain	₱ doz. $5.00
Bonanza Improved	each $7.50
Dandy	each $10.00
Eureka Improved	each $20.00
New Century	each $20.00
Ranger	each $30.00

10-lb. cans, 10 in case....6½¢ 7 ¢ 6 ¢
10-lb. cans, less than 10.....10 ¢ 10 ¢ 8 ¢
Less quantity..10 ¢ 10 ¢ 8 ¢

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extensions, Bit—
Ford's Auger Bit Extensions....40&5%

Extractors, emon Juice—
—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's Jap'd and Galv., 50 & 5%; Bronze and Plated.....50%
Walling's 50%
Upson's Patent.....40%

Cord and Weight—
Ives, ℔ gro., $1.08.....10%
Titan, ℔ gro., $0.66.....10%

Corrugated—
Acme Corrugated Fasteners.....70%

Faucets—
Cork Lined.....50&10@60%
Metallic Key, Leather Lined, .. 60&10@70%
Red Cedar.....40&5@40&10&5%
Petroleum .....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star 60%
West Lock.....60&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I.X.L. Cork Lined..50%
John Sommer's Reliable Cork Lined.. 50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined...50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
Self Measuring:
Enterprise, Self Measuring and Pump, ℔ doz., $36.00.....40&10%
Lane's, ℔ doz., $36.00.....40&10%
National Measuring, ℔ doz. $36.40&10%

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic—
List Nov. 1, 1899.
Best Brands.....70&10@75&10%
Standard Brands.....75&10@80%
Lower Grade....75&10&10@80&10%
Disston's Superfine.....60%
Gold Medal.....70%
McCaffrey's American Standard, 60&10&10%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97.....33⅓@40%

Fixtures, Fire Door—
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 .....$3.75
Fusible Links, No. 96.....50%
Expansion Bolts, No. 107.....60&10%

Grindstone—
Net Prices:

Inch	*15*	*17*	*19*	*21*
Per doz.	*$3.60*	*3.85*	*4.15*	*4.65*

Peck, Stow & Wilcox Co.:

In.....	15	17	19	21	24
	$4.00	4.40	4.75	5.50	6.50....30%

Reading Hardware Co.....60%

Fodder Squeezers—
See *Compressors.*

Forks—
American Fork & Hoe Co.:
Iowa Dig-Ezy Potato.....70&5%
Hay, Regular, 3-tine.....45&20&12½%
Hay, Regular, 4-tine.....60&7½&5%
Champion, Hay.....60&12½%
Acme, Hay.....60&20%
Manure, Regular, 4-tine.....65&5%
Manure, Regular, 5 and 6 tine...70%
Champion, Manure.....65&5%
Columbia, Manure.....70%
Acme, 4-tine.....60&10&5%
Round Shoulder Header, 4-tine..65%
Champion, Header.....65%
Dakota, Header.....65%
Kansas Header.....65%
Wood, Barley.....35&5%
Steel, Barley.....66⅔%
Columbia, Spading.....70&7½&5%

Frames— Wood Saw—
White, S'g't Bar, per doz.75@80¢
Red, S'g't Bar, per doz.$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt.....	*1*	*2*	*3*	*4*	*6*
Each....	*$1.25*	*$1.60*	*$1.90*	*$2.20*	*$2.80*

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped..3.65
Waterproof Dbl. Taped..4.40
Waterproof Tpl. Taped..5.15
10&5&2½%

Gates, Molasses and Oil—
Stebbins' Pattern.....80@80&5%

Gauges—
Marking, Mortise, &c..50@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c.....50&50&10%
Disston's Marking, Mortise, &c.60&10%
Wire, Brown & Sharpe's.....33⅓%
Wire, Morse's.....25%
Wire, P., S. & W. Co.....33⅓%

Gimlets— Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $1.00; 2, $1.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $1.30; 2, $1.60

Glass, American Window
See *Trade Report.*

Glasses, Level—
Chapin-Stephens Co.....65@65&10%
Disston & Sons.....60&10%

Glue, Liquid Fish—
Bottles or Cans, with Brush, 25&10@50%
Elwell's 50%

Grease, Axle—
Common Grade...gro.$6.00@$6.50
Dixon's Everlasting, 10-lb. pails, ea. 85¢; in boxes, ℔ doz., 1 lb, $1.20; 2 lb.....$2.00
Helmet Hard Oil.....25%

Grinders—
Pike Mfg. Co.:
Hand and Foot Power, Pyko Nos. 1, 2, 3; Pyko Primo; Pyko Peerless; Pyko Spiral (foot power).33⅓%
Mower Knife and Tool, $5.00..40&10%
Royal Mfg. Co.:
Hand and Foot Power, each, Nos. 01, $1.75; 1A, $2.50; 10, $5.00 .....33⅓%
Sickle Grinders, each, Nos. 20, $5.00; 20A, $6.00; 20A Combined, $6.50 .....40%
Disc Grinders, each, $2.50.....40%

Grindstones—
Pike Mfg. Co.:
Improved Family Grindstones, ℔ inch, ℔ doz., $2.00.....33⅓%
Richards Mfg. Co., Eli and Cycle, Ball Bearing, mounted.....40%

Grips, Nipple—
Perfect Nipple Grips.....40&10&2%

Halters and Ties—
Cow Ties.....70&10%
Bridgeport Chain Co.:
Triumph Coil and Halters,35&2½@40%
Brown Coil and Halters..45@50&5%
Brown Cow Ties.....50&5@50&10&5%
Brown Tie Outs.....70&10@75&5%
Covert Mfg. Co.:
Web .....30&2%
Jute Rope.....35%
Sisal Rope.....20%
Cotton Rope.....45%
Hemp Rope.....45%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Niagara Coil and Halters...45@50&5%
Niagara Cow Ties.....45&5@50&10&5%

Hammers—
Handled Hammers—
Heller's Machinists'....55&10@55&10&5%
Heller's Farriers.....40&5@40&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel.....40&10@50%
Farriers' .....40&10@50%
Riveting .....40&10@50%
Machinists' .....66⅔@5%
Blacksmiths' 50%
Elmore Shoemakers' Hammers.....75%
Fayette R. Plumb:
A. E. Nail.....40&2½@40&12½%
Eng. and B. S. Hand.50&10&5@60&5%
Machinists' Hammers.....60&10&5%
Rivet and Tinners'.40&7½@40&12½&5%
Victor Magnetic Tack, ℔ gro....$7.75

Heavy Hammers and Sledges—
Under 3 lb., per lb., 50¢...80&10%
3 to 5 lb., per lb., 40¢...80&10&10%
Over 5 lb., per lb., 30¢.....
Over 5 lb., per lb., 30¢.80&10&10%

Handles—
Agricultural Tool Handles—
Axe, Pick, &c....60&10@60&10&5%
Hoe, Rake, &c.....40%
Fork, Shovel, Spade, &c.:
Long Handles.....40%
D Handles.....40%

Cross-Cut Saw Handles—
Atkins' 40%
Disston's Handles and Saw Tabs..45%

Mechanics' Tool Handles—
Auger, assorted...gro.$3.00@$3.50
Brad Awl.....gro.$1.65@$1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65; Hickory.....$2.15@2.40
Socket Firming, Apple, $1.75@ $1.95; Hickory.....1.60@1.75
Socket Framing, Hickory, $1.60@$1.75
File, assorted.....gro.$1.30@$1.40
Hammer, Hatchet, &c.. 60&10@60&10&5%
Hand Saw, Varnished, doz., 80¢ 85¢; Not Varnished.....65@75¢
Plane Handles:
Jack, doz., 30¢; Fore, doz....45¢
Chapin-Stephens Co.:
Carving Tool.....30@30&10%
Chisel .....60@60&10%
File and Awl.....60@60&10%
Saw and Plane.....30@30&10%
Screw Driver.....30@30&10%
Millers Falls Adj. and Ratchet Auger Handles .....15&10%
Nicholson Simplicity File Handle .... ℔ gro. $0.85@$1.50
J. L. Osgood:
Indestructible File and Tool, ℔ gro., No. 1, $8.00; No. 2, $6.50; No. 3, $5.00; No. 4, $3.50; No. 5, $10.00.....gro. lots 10%
W. A. Zelnicker Supply Co.:
Hammer, ℔ doz., 12 in., $2.00; 14 in., $2.00; 16 in., $2.30; 18 12., $2.50; 20 in., $2.70; 22 in., $3.00; 24 in., $3.30; 28 in., $3.50; 30 in., $3.80.
Sledge, ℔ doz., oval, 30 in., $3.80; octagon, 30 in., $3.80; oval, 36 in., $4.00; octagon, 36 in., $4.00.
Axe, ℔ doz., 28 to 34 in., $5.60; 36 in., $5.80.
Adze, ℔ doz., 36 in., $5.80; 36 in., $7.80.
Pick, ℔ doz., R. R., 36 in., $8.00; coal, 34 in., $5.80.
Hatchet, ℔ doz., 12 to 14 in., $2.00.
50%

Hangers—
NOTE.—Barn Door Hangers are generally quoted per pair, without track and Parlor Door Hangers per double set with track, &c.
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&10%
Roller Bearing.....70%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00..60&10%
Roller Bearing, No. 11, $15.00, 60&10%
Roller Bearing, Ex. Hy., No. 22, $18.00.....60&10%
Bull Dog, $24.00.....70%
Lane Bros. Co.:
Parlor, Ball Bearing, $4.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion per set of 4 Hangers, complete with track.....$2.25
Barn Door, Standard.....60&10%
Hinged .....net $6.08
Covered .....60&5%
Special .....70&5%
Trolley Hangers and track...50%
Lawrence Bros.:
Cleveland .....70&7½%
Clipper, No. 75.....60%
Crown .....55&10%
Cyclone, No. 40.....net $6.50
Tandem, No. 50.....net $7.50
New York.....55&10%
Trolley, No. 30, ℔ pair.....$1.25
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2..70%
Anti-Friction 60%
Hinged Hangers, King Charm.60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track, No. 3..$2.25
Roller B'r'g St'l Track No. 12.$2.20
Roller B'r'g St'l Track No. 13.$2.50
Roller B'r'g, Nos. 39, 41, 43, 70&7½%
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 18.....50&10%
Seal, Steel Track No. 8.....$2.25
Auto Adj. Track No. 22..50&5%
Trolley B, D, No. 17, $1.25; F, D, No. 120, $2.25; No. 121, $2.45; No. 150.....$2.50
Safety Underwriters F. D. No. 101 .....50%
Tandem No. 41..2½ and 3 60&10%
Palace, Adjustable Track No. 132 .....50&5%
Royal, Adjustable Track No. 122 .....50&10%
Ives' Wood Track No. 1.....$2.25
Trolley B, D, No. 20.....50&10%
Trolley B, D, No. 24, $1.30; No. 27, $1.40; No. 28.....$1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2.70&7½%
Anti-friction, No. 42; No. 44, sizes 2½ and 3.....60%
Hinged Tandem No. 45....60&5%
Folding Door B. B. Swivel No. 135 .....40%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing, ℔ doz. 4 in., $12.00; 5 in., $14.00..40&10%
Myers' Stayon Hangers.....60%

Hangers— Garment—
Pullman Trouser, ℔ gro., No. 1 $3.00; No. 4, $21.00; No. 5, $16.50; No. 8, Black Enamel, $7.50; No. 10, $21.00; No. 12, $8.00; No. 15, Rods, $9.00; No. 18, Loops.....$10.00
Victor Folding.....℔ gro. $9.60

Gate—
Myers' Patent Gate Hangers, ℔ doz. net 50%

Joist and Timber—
Lane Bros. Co.....35%

Hasps—
Griffin's Security Hasp.....50&10%
McKinney's Perfect Hasp, ℔ doz..60%

Hatchets—
Regular list, first qual.50&10@60%
Second quality.....60@60&10%

Heaters, Carriage—
Clark, No. 5, $1.25; No. 5B, $1.50; No. 3, $1.75; No. 3D, $2.00; No. 7D, $2.25; No. 3E, $2.50; No. 1, $3.00.....25%
Clark Coal, ℔ doz., $0.75.....20%

Hinges—
Blind and Shutter Hinges
Surface Gravity Locking Blind: Doz. Sets with Fastenings, No. 1, $0.70; No. 3, $1.25; No. 5, $2.65.
Mortise Shutter.....80%
Mortise Reversible Shutter...80%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70@75%
Parker Wire Goods Co.
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $5.00; No. 111, for brick, $9.00.....20%
Reading's Gravity.....60%
Stanley's Steel Gravity Blind Hinges, No. 1647½, ℔ doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&5%
Acme, Lull & Porter.....75%
Queen City Reversible.....75%
Shepard's Noiseless, Nos. 60, 65, 55 .....75&5%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&5%
Clark's O. P., No. 1.....75&10%
Clark's O. P., Nos. 3 and 5....75&5%
Tip Pat'n, No. 1.....75&10%
Clark's No. 3.....75&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....70&10&5%
Shepard's Double Locking.....75%
Champion Gravity Locking.....75&5%
Picneer .....75&10%
Empire 65%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60&10%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L'f'chs.	*$2.00*	*2.70*	*5.00*
Hinges only.....	*1.25*	*1.90*	*3.50*
Latches only.....	*.70*	*.75*	*.35*

New England:
With Latch.....doz..@$2.00
Without Latch.....doz..@$1.60
Reversible Self-Closing:
With Latch.....doz..@$1.75
Without Latch...doz. ...@$1.35
Western:
With Latch.....doz. $1.75
Without Latch.....doz..$1.15
Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3.....70%

Miscellaneous—
Griffin Mfg. Co., Fleur de Lis Surface Hinges, ℔ doz. prs.....$1.00

Pivot Hinges—
Bommer Bros, Pivot, Ball Bearing 40%
Lawson Mfg. Co, Matchless.....30%

Spring Hinges—
Holdback, Cast Iron...$6.75@$7.00
Non-Holdback, C'st Iron$6.50@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....40%
Bardsley's Patent Checking.33⅓%
Bommer Bros.:
Spring Butt Hinges.....40%
Surface Floor, Ball Bearing 40%
Mortise Floor, Ball Bearing.40%
Lavatory Hinges.....40%
Non-Holdback Screen Door, Nos. 2000 and 900.....40%
Holdback Screen Door, No. 900.....℔ gro. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor.50%
Garden City Engine House...25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American 30%
Columbia, ℔ gr., No. 14, $9.00; No. 18.....$25.00
Columbia, Adj., No. 7, ℔ gr.$12.00
Gem, new list.....30%
Clover Leaf and Acorn, per gro. $12.00
Oxford, new list.....30%
Floor Spring Hinges.....65&10%
Columbian Steel.....65&10%
Lawson Mfg. Co.:
Matchless Spring Hinges.....30%
Matchless Jamb Hinges.....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....℔ gr. $9.00
Chief Ball Bearings Floor Hinge 50%
Ball Bearing Door.....25%
No. 777, Sheet Steel Holdb'k, ℔ gr, pr. $9.00
Standard Mfg. Co.:
Champion Double Acting Door Hinge .....25&10&10%
Standard Double Acting Floor Hinge .....25&10&10%
Superior Spring Hinge Co.:
Superior Floor Hinges.....40%
Spring Hinges.....40%
Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—
Strap and T Hinges, &c., list February 10, 1908:
Light Strap Hinges....65%
Heavy Strap Hinges....75%
Light T Hinges.....60%
Heavy T Hinges.....40&10%
Extra Hvy. T Hinges.65&10%
Hinge Hasps.....40%
Cor. Heavy Strap.....75%
Cor. Ex. Heavy T...65&10%
Extra, 5@—

Screw Hook and Strap.
6 to 12 in..lb. 3½¢
1½ to 20 in..lb. 3½¢
22 to 36 in..lb. 3 ¢

Screw Hook and Eye:
¾ to 1 inch.....lb. 6½¢
⅝-inch .....lb. 7½¢
½-inch .....lb. 8½¢

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—
M'f'gr's list, price per gross:

Inch	*15*	*16*	*17*	*18*
Galv. Open....	*$35*	*$39*	*$42*	*$46*
Jap. Open....	*26*	*28*	*31*	*33*
Galv. Funnel...	*43*	*48*	*52*	*56*
Jap. Funnel....	*33*	*36*	*39*	*43*

10&7½&5%

Masons' Etc.
Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each $1.05
Steel Mortar, No. 158.....each $1.35

Hoes— Eye-

Scovil and Oval Pattern, 60&10@60&10&10%
Grub, list Feb. 23, 1899, 70&10@70&10&10%
D. & H. Scovil.....27½%
Am. Fork & Hoe Co. (Scovil Pattern).....60&5%

Handled—

Cronk's Weeding, No. 1, $2.00; No. 2, $2.50
Star Double Bit.....$2.50
American Fork & Hoe Co.:
Regular, Cotton.....75&10&5&2½%
Crescent, Cultivator.....75&2½%
Mattock, Senior.....70%
Mattock, Junior.....70%
Sprouting.....50%
Tobacco, Harper's.....66⅔&15&10%
Warren.....55&10&10&5%
Ivanhoe.....65&15&10%
Cultivator, B B 6.....70&10&10&5%
Cultivator, B B 6½.....70&10&10&5%
Weeding, Acme.....72½&10&2½%
Scuffle, Lightning.....60&5%

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ℔ doz. $24.00.....45&10%

Door—

Bardsley's, Iron, 40%; Brass and Bronze.....25%
Empire.....50%
Pullman.....25%
Richards Mfg. Co.: No. 117, Ever-ready, 40%; Nos. 118, 119, Sure Grip.....50%
Superior.....40%

File and Tool—

Nicholson File Holders and File Handles.....33⅓@40%

Fruit Jar—

Triumph Fruit Jar Holder, ℔ gross, $18.00; ℔ doz.....$2.00

Trace and Rein—

Fernald Double Trace Holder, ℔ doz. pairs.....$1.25
Dash Rein Holder, ℔ doz.....$1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, 50%; German.....33⅓%

Hooks—Cast Iron—

Bird Cage, Reading.....40%
Clothes Line, Reading List.....40%
Coat and Hat, Reading.....45&20%
Coat and Hat, Wrightsville.....60&5%
Harness, Reading List.....40%

Wire—

Belt, Nos. 1 to 15....75&10@80%
Wire C. & H. Hooks..80@80&10%
Bradley Metal Clasp Wire, Coat and Hat, 75&10&80%; Ceiling..75&10&80%
Columbian Hdw. Co., Gem.....75&10%
Parker Wire Goods Co., King..75&10%
Wire Goods Co.:
Acme, 60&10%; Chief, 70&10%; Crown, 75%; Czar, 65&10%; Brace, 75%; Czar Harness, 50%; Ceiling, 75%.

Wrought Iron—

Box, 6 in., per doz., $0.90; 8 in., $1.15.
Cotton.....doz. $1.25@$1.50
Wrought Staples, Hooks, &c.—See Wrought Goods.

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, best, all sizes, per doz., $2.75@$3.00
Grass, common grades, all sizes, per doz.....$1.25@$1.50
Whiffletree.....lb. 5¾@6¢
Hooks and Eyes:
Brass.....60@60&10%
Malleable Iron.....70@70&10%
Covert Mfg. Co. Gate and Scuttle Hooks.....40%
Turner & Stanton Co. Cup and Shoulder.....85&10%
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition.....ft. 6@6½¢
3-ply Guaranteed....ft. 8½@9¢
4-ply Guaranteed....ft. 9½@12¢
Cotton Garden, ¾-in., coupled:
Low Grade.....ft. 8@ 9¢
Fair Quality.....ft. 10@11¢

Irons— Sad—

From 4 to 10.....lb. 2¼@2¾¢
B. B. Sad Irons.....lb. 3¼@3½¢
Mrs. Potts', cents per set:

Nos.	50	55	60	65
Jap'd Caps	*.86*	*93*	*96*	*93*
Tin'd Caps	*.91*	*88*	*1.01*	*98*

New England Pressing..lb. 3¾@4¢

Bar and Corner—

Richards Mfg. Co., Bar, 60&10%; Corner.....60%

Pinking—

Pinking Irons.....doz. 60@65¢

Irons, Soldering

See *Coppers.*

Jacks, Wagons—

Covert Mfg. Co.:
Auto Screw.....30&2%; Steel, 45%
Lockport.....50%
Lane's Steel.....30&5%
Richards' Tiger Steel, No. 130...50&10%
Smith & Hemenway Co.'s.....25%

Ladder—

Richards Mfg. Co., Ladder Jacks..50%

Jointers—

Pike Mfg. Co., Saw Jointers, $7.00..42%

Kettles—

Brass, Spun, Plain.....20@25%
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co....60%

Corn—

Columbian Cutlery Co., Wilcut Brand Knives and Hooks.....60%
American Fork & Hoe Co.:
Easy Cut, ℔ doz No. 10 C H...$2.10
Easy Cut, ℔ doz., No. 10 B C H..$2.20
Acme, ℔ doz.....$2.35
Dent, ℔ doz.....$2.35
Adjustable, Serrated, ℔ doz.....$1.90
Serrated, ℔ doz.....$1.85
Yankee, No. 1 C H.....$1.35
Yankee, No. 2 C H.....$1.15

Drawing—

Standard List.....80&10@—%
C. E. Jennings & Co., Nos. 45, 46, 25&7½%
Jennings & Griffin, Nos. 41, 42, 66⅔&7½%
Swan's.....66⅔@70%
Watrous.....16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—

Serrated Edge, per doz. $5.00@5.50
Iwan's Sickle Edge.....℔ doz. $9.50
Iwan's Serrated.....℔ doz. $10.00

Miscellaneous—

Farriers' .....doz. $2.60@3.55
Wostenholm's .....℔ doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch or Maple, Rubber Tip.....gro. $1.25@1.40
Carriage, Jap., Drive, all sizes, gro. 35@40¢
Door, Mineral.....doz. 65@70¢
Door, Por. Jap'd.....doz. 70@75¢
Door, Por. Nickel..doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c. 15%

Lacing, Leather—

See *Belting, Leather*

Ladders, Store, &c.—

Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—

L. & G. Mfg. Co., Melting and Plumbers'.....25%
P., S. & W.....40&10%
Reading.....60%

Lamps,—

Hammer's M. I. Hand.....45%

Lanterns—Tubular—

Regular, No. 0.....doz. $3.50@4.00
Side Lift, No. 0.....doz. $4.00@4.50
Hinge Globe, No. 0. doz. $4.00@4.50
Other Styles.....40@40&10%

Bull's Eye Police—

3-inch .....$3.75@4.00

Latches— Thumb—

Roggin's Latches, Jap'd, with Screws .....doz. 35@40¢

Door—

Cronk & Carrier Mfg. Co., No. 101, ℔ doz. $2.00
Richards' Bull Dog, Heavy, No. 125.....50&5%
Richards' Trump, No. 127.....$1.50

Leaders, Cattle—

Small.....doz. 50¢; large, 60¢
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—

See *Pumps—*

Lifters, Transom—

R. & E.....10%

Lines—

Wire Clothes, Nos.	*18*	*19*	*20*
100 feet.....	*$2.30*	*1.95*	*1.75*
75 feet.....	*$1.95*	*1.65*	*1.50*

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons'.....30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....℔ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines.....40%
Clothes Lines, White Cotton....20%
Shade Cord, Cotton or Linen....20%

Locks— Cabinet—

Cabinet Locks....33⅓@33⅓@5%

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....10%

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.—

Ives' Patent:
Crescent.....10%
Automatic Gravity Metal Sash, ℔ gro., $149.58.....10%
Window Ventilating.....10%
Pullman Patent Ventilating Lock..25%
Reading Sash Locks.....40%
Taylor Mfg. Co., Perfect Ventilating, ℔ doz.....$0.75@$1.00

Machines—Boring—

Com. Upr't, without Augers, $2.00@2.25
Com. Angl'r, without Augers, $2.25@2.50
Ford Auger Bit Co.....$22.00
Jennings', Nos. 1 and 4.....25&7½%
Millers' Falls.....5.75
Snell's, Upright, $2.65; Angular, $2.90
Swan's Improved.....40&10%

Corking—

Reisinger Invincible Hand Power... ℔ doz. $48.00

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist.30%
Moore's Hand Hoist, with Lock Brake.....20%
Moore's Cyclone High Speed Chain Hoist.....25%

Ice Cutting—

Chandler's.....12½%

Washing—

Boss Washing Machine Co.:	Per doz.
Boss No. 1	$57.00
Boss Rotary	$57.00
Champion Rotary Banner No. 1	$57.00
Standard Champion No. 1	$50.00
Standard Perfection	$27.00
Cincinnati Square Western	$33.00
Uneeda American, Round	$33.60

Mallets—

Hickory .....45&5@50%
Lignumvitæ .....45&5@50%
Tinners' Hickory and Applewood .....doz. 45&5@50%

Mangers, Stable—

Swett Iron Works.....50%

Mats, Door—

Acme Flexible Steel.....50%
Elastic Steel (W. G. Co.), new list.50%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.:
Coffee.....20@25%
Shell and Corn.....25&10%
National list Jan. 1, 1902.....30%
Parker's Columbia and Victoria..33⅓%
Parker's Box and Side.....50&10%
Swift, Lane Bros. Co.....30%

Motors, Water—

Divine's Red Devil.....30%

$2.50	3.50	10.00	15.00	
No. 1.	2	3	4	
Lippincott's:				
No.....	1	2	3	4
	$2.50	3.50	10.00	15.00..33⅓%

Pike Mfg. Co., Tool and Knife Grinding.....33⅓%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest, 10-in., $2.00; advance 10¢ for each size.
Cheap, 10-in., $2.25; advance 15@20¢ for each size.
Better Grade, 10-in., $3.00; advance 25¢ for each size.

	12	*14*	*16*	*18 in.*
High Grade...	*$4.50*	*4.75*	*5.00*	*5.25*

Continental.....60%
Great American.....70%
Great American Ball B'r'g, new list.70%
Quaker City.....70%
Pennsylvania.....60%
Pennsylvania, Jr., Ball Bearing. 50&10&5%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%

Nails—

Wire Nails and Brads, Miscellaneous .....85&5@85&10%
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers', &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Anchor	23	21	20	19	18	.. ℔ lb. net, 12¢
Coleman	13	12	12	11	11	net ℔ lb
New Haven..	23	21	20	19	18	.. ℔ lb. net, 12¢
Livingston ..	19	18	17	16	16	.....10%
Western						℔ lb 8½¢

Jobbers' Special Brands, per lb. 9¢

Picture—

	1½	*2*	*2½ 3 in.*
Brass Hd. gro.	*.45*	*.55*	*.60 .70*
Por. Head. gro. ..	*1.10*	*1.10*	*1.10*

Upholsters—

Brass 30%
Plated .....30&10%

Nippers—

See *Pliers and Nippers.*

Nipples—

Standard Nipple Co.:
Wrought Pipe Nipples.....80%

Nuts— *Blank or Tapped.*

Cold Punched:	*Off list.*
Square	*5.50¢*
Hexagon	*6.00¢*
Square, C., T. & R.	*5.80¢*
Hexagon, C., T. & R.	*6.60¢*
Hot Pressed:	Off list.
Square	*5.90¢*
Hexagon	*6.40¢*

Oakum—

Best .....lb. 6½¢
U. S. Navy.....lb. 6 ¢
Navy .....lb. 5 ¢
Plumbers' Spun Oakum..2¾@3 ¢

Oil—

Pike Mfg. Co., Stonoil.....40%

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated.....75&10%
Chase or Paragon:
Brass and Copper.....50&10%
Zinc .....65&10@70%
Railroad .....60&10&10%
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%
Hero Fruit Jar Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, etc.....60@60&10%
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 10%; Old Pattern, Nos. 1, 2, 3, 4, 50%.
Maple City Mfg. Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers—Packing Box—

Herculever, ℔ doz., $24.....30%

Can Openers—

Per doz.
Sprague, Iron Handle....30@35¢
Sprague, Wood Handle.....40¢
Sardine Scissors.....$1.75@3.00
Can and Bottle Openers, ℔ doz., net: Yankee, $0.75@$0.85; Little Gem, $0.50@$0.65; Nifty.....$0.75

Egg—

Hartigan Nickel Plate, ℔ doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope, any quantity.....16@17¢

Rubber—

(Fair quality goods.)
Sheet, C. I.....11@12¢
Sheet, C. O. S.....11@12¢
Sheet, C. B. S.....12@13¢
Sheet, Pure Gum.....40@45¢
Sheet, Red.....40@50¢
Jenkins' '96, ℔ lb, 80¢.....25%

Miscellaneous—

American Packing....lb. 7@10 ¢
Cotton Packing.....lb. 16@25 ¢
Italian Packing.....lb. 9@10¢
Jute .....lb. 4@4½¢
Russia Packing.....lb. 9@10¢

Pails, Water, Well, &c.—

See *Buckets.*

Paint—

Dixon's Silica-Graphite, in 1 gal. pails and 5 gal. kegs, 25%; packages of larger size.....20%

Pans— Dripping—

Standard List.....75&5@75&10%
Edwards, Royal Blue.....75%

Fry—

Common Lipped:

Nos.....	*1*	*2*	*3*	*4*	*5*
Per doz....	*$0.75*	*0.85*	*0.95*	*1.15*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz....	*$1.75*	*2.25*	*2.80*	*3.15*

Paper—Building Paper

Asbestos: lb.
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft..2½¢
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft.....3½¢
Mill Board, Sheet, 40 x 40 in., 1-32 to ½ in.....3½¢
Per roll.
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll, 48@58¢
Medium weight, 30 lbs. to roll, 58@70¢
Heavy weight, 40 lbs. to roll, 75@78¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 2, 6 and 4½ sq. ft. to lb., ton.....$54.50
Red Rope Roofing, 250 sq. ft. per roll.....$1.75

Tarred Paper—

1 ply (roll 400 sq. ft.), ton, $34.00@$38.00
2 ply, roll 108 sq. ft.....65¢
3 ply, roll 108 sq. ft.....88¢
Slater's Felt (roll 500 sq. ft.).80¢

Sand Paper and Cloth—

Flint and Emery.....50&10%
Garnet Paper and Cloth.....25%

Parers—Apple—

Goodell Co.:
Family Bay State.....℔ doz, $15.00
Improved Bay State.....℔ doz. $36.00
New Lightning.....℔ doz. $7.00
Turn Table '98.....℔ doz. $8.00
White Mountain.....℔ doz. $5.00
Bonanza Improved.....each $7.50
Dandy.....each $10.00
Eureka Improved.....each $20.00
New Century.....each $20.00
Ranger.....each $30.00

Livingston Nail Co.:
Daisy ..... ℔ doz. $4.00
Little Star ..... ℔ doz. $5.00
Rocking Table ..... ℔ doz. $6.20
Reading Hardware Co.:
Advance ..... ℔ doz. $4.00
Baldwin ..... ℔ doz. $4.00
Reading 72 ..... ℔ doz. $3.25
Reading 78 ..... ℔ doz. $6.25

Orange—
Goodell Co., Success ..... each $20.00

Potato—
Saratoga ..... ℔ doz. $7.00
White Mountain ..... ℔ doz. $6.00

Picks and Mattocks—
(List Jan., 1908.)
List ..... 75&10%
Cronk's Handled Garden Mattock, ℔ doz., $3.00 ..... 33⅓%

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass ..... 50@50&10%
Iron, list Nov. 11, '85 .. 60@60&10%

Pipe, Cast Iron Soil—
Eastern Prices:
Standard, 2-6 in. ..... 68% } Extra, 10 & 10&5%
Extra Heavy, 2-6 in. 74%
Fittings, Standard and Heavy 80¾%

Pipe, Merchant—
Carloads to Consumers:

	Steel. Blk.	Steel. Galv.	Iron. Blk.	Iron. Galv.
	%	%	%	%
⅛ and ¼ in..				
⅜ in.....				
½ in.....	See Trade Report			
¾ to 6 in....				
7 to 12 in....				

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:
First-class 87%
Second-class 90%

Pipe, Stove—

	Per 100 joints. C. L.	L. C. L.
Edwards' Nested:		
5 in., Standard Blue	$6.25	$7.25
6 in., Standard Blue	6.75	7.75
7 in., Standard Blue	7.75	8.75
5 in., Royal Blue	7.00	8.00
6 in., Royal Blue	7.50	8.50
7 in., Royal Blue	8.50	9.50
Wheeling Corrugating Co.'s Nested:		
5 in., Uniform Color	$5.90	$6.90
6 in., Uniform Color	6.40	7.40
7 in., Uniform Color	7.40	8.40

Planes and Plane Irons—
Wood Planes—
Bench, first qual. .. 30@30&5%
Bench, second qual. .. 30@30&5%
Molding ..... 25@25&5%
Chapin-Stephens Co.:
Bench, First Quality 30%
Bench, Second Quality 40%
Molding and Miscellaneous 25%
Toy and German 30%
Union 60%

Iron Planes
Chaplin's Iron Planes 60%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list Dec. 12, '06 ..... 25%
Buck Bros. 30%
Chapin-Stephens Co. 25%
Union 50%
L. & I. J. White ..... 20&5&25%

Planters, Corn, Hand—
Kohler's Eclipse ..... ℔ doz. $7.50

Plates—
Felloe ..... lb. 3¾@4¢
Avery Stamping Co.:
Standard Wrot, Steel Felloe Plates in 100 lb kegs, per 100 lb, ¾-in. to 1¼-in., $4.00 net; 1¼-in. to 2-in., inclusive, $3.75 net.

Steel Pipe Hook—
Never-Break ..... 75&10%

Pliers and Nippers
Button Pliers .. 75&5@75&10&5%
Gas Burners, per doz., 5 in., $1.25 @1.30; 6 in., $1.45, $1.50.
Gas pipe.. 7 $2.00 | 8 $2.25 | 10 $2.75 | 12-in. $3.50
Acme Nippers ..... 50&5%
Cronk & Carrier Mfg. Co.:
American Button 60%
Improved Button ..... 75&10%
Cronk's 60%
No. 80 Linemen's 50%
Stub's Pattern 45%
Combination and others 33⅓%
Elmore Tool Mfg. Co.:
Gas Pliers 70%
Wire and Cutting Pliers 75%
Heller's Farriers' Nippers, Pincers and Tools ..... 40&5@40&10&5%
P., S. & W. Tinners' Cutting Nippers 40%
Swedish Side, End and Diagonal Cutting Pliers 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels ..... 30@30&10%
Chapin's Imp. Brass Cor. 40@40&10%
Pocket Levels ..... 30@30&10%
Extension Sights ..... 30@30&10%
Machinists' Levels ..... 40@40&10%
Disston & Sons:
Shafting Levels ..... 60&10%
Pocket Levels ..... 60&10%
Plumbs and Levels ..... 60&10%
Track Level and Gauge ..... 60&10%
Woods' Extension 33⅓%

Points, Glaziers'—
Bulk and 1-lb papers .... lb. 9 ¢
¼-lb. papers ..... lb. 9½¢
⅛-lb. papers ..... lb. 10 ¢

Police Goods—
Manufacturers' Lists .. 25@25&5%
Tower's 25%

Polish—Metal, Etc—
Ladd Co.:
Putzade Liquid, ℔ gro., ⅛ pts., $12.00; 1 pts., $20.00; 1 qts., $40.00; ℔ doz., ½ gals., $6.35; 1 gals., $12.00.
Prestoline Liquid, No. 1 (½ pt.), ℔ doz., $3.00; No. 2 (1 qu.), $9.00.. 40%
Prestoline Paste 40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ℔ doz. 50¢; ℔ gro. $4.50; ½ lb boxes, ℔ doz. $1.25; 1 lb boxes, ℔ doz. $2.25.
U. S. Liquid, 8 oz. cans, ℔ doz., $1.25.
Barkeepers' Friend Metal Polish, ℔ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, ℔ lb 10¢
Black Eagle, Liquid; ⅛ pt. cans.. ℔ doz. 75¢
Black Jack Paste, ¾ lb cans, ℔ gr. $9.00
Black Kid Paste, 5 lb can ... each, $0.65
Ladd's Black Beauty Liquid, per 100 tins $6.75
Joseph Dixon, ℔ gr. $5.75 ..... 10%
Dixon's Plumbago ..... ℔ lb 8¢
Fireside ..... ℔ gr. $2.50
Gem, ℔ gr. $4.50 ..... 10%
Japanese ..... ℔ gr. $3.50
Jet Black ..... ℔ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ℔ doz. $1.50

Window Polish—
Benj. P. Forbes:
Glasbright, No. 2, gal pails, ℔ doz., $24.00; each, $2.50; 1 lb cans, each ..... 75¢
Glasbright Powder, bbls., ℔ lb..20¢

Poppers, Corn—
1 qt. Square..doz.$0.80; gro.$8.75
1 qt. Round..doz.$0.90; gro.$10.00
1½ qt. Square.doz.$1.20; gro.$12.00
2 qt. Square..doz.$1.50; gro..$15.00

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 6 ft., 46¢; 6½ ft., 48¢; 7 ft., 50¢.
Steel Hitching Posts ..... each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled 40%
Tinned ..... 30&10%

Powder—
Black Sporting:
Kegs (25 lb.)..$5.00@5.50
Half Kegs (12½ lb.), $2.75@3.00
Quarter Kegs (6¼ lb.), $1.50@1.65
Canisters, pounds... .25
Canisters, ½ pounds. .15
Canisters, ¼ pounds. .12
} Discount to the trade, 10%.
NOTE.—Prices vary according to territory.
King's Semi-Smokeless:
Keg (25 lb bulk) $6.50
Half Keg (12½ lb bulk) $3.50
Quarter Keg (6¼ lb bulk) $1.90
Case 24 (1 lb cans bulk) $8.50
Half case (1 lb cans bulk) $4.50
King's Smokeless: Shot Gun. Rifle.
Keg (25 lb bulk) $12.00 $15.00
Half Keg (12½ lb bulk).. 6.25 7.75
Quarter Keg (6¼ lb bulk) 3.25 4.00
Case 24 (1 lb cans bulk).. 14.00 17.00
Half case 12 (1 lb c. bk).. 7.25 8.75

Presses—
Fruit, Wine and Jelly—
Enterprise Mfg. Co. ..... 20@25%
Seal Presses—
Morrill's No. 1, ℔ doz., $20.00 ..... 50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail, Etc.—
Cyclops 50%
Elmore Tool Mfg. Co.:
Drop Forged Tack Pullers 10%
Nail Pullers 40%
Miller's Falls, No. 3, ℔ doz., $12.00.. 33⅓&10%
Morrill's No. 1, Nail Puller, ℔ doz. $20.00 ..... 50%
Pearson No. 1, Cyclone Spike Puller, each $30.00 ..... 50%
The Scranton Co, Case Lots:
No. 2B (large) $5.50
No. 3B (small) $5.00
Smith & Hemenway Co.:
Diamond B 70%
Giant 50%
Staple Pullers, Utica and Davison 60%
Taylor Mfg. Co., Sampson Tack, ℔ doz. $0.40

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz.	$0.90	.15	.60	1.05
Hay Fork, Swivel or Solid Eye, doz., ¼ in., $1.25; 5 in., $1.55				
Inch	2	2¼	2½	
Hot House, doz..	$0.65	.85	1.20	
Inch	1¼	1½	1¾	2
Screw, doz....	$0.16	.19	.23	.30
Inch	1¾	2	2¼	2½
Side, doz.....	$0.25	.40	.55	.60
Inch	1½	1¾	2	2½

Sash Pulleys—
Common Frame; Square or Round End, per doz., 1¾ and 2 in ..... 17@20¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in.... 20@21¢
Acme, No. 35..1¾ in., 19¢; 2 in., 20½¢
American Pulley Co.:
Wrought Steel American Plain Axle ..... 50&10%
Wrought Steel, Eagle, ℔ doz., 1¾ in., 17¢; 2 in., 20¢; 2¼ in. ..... 27¢
Top Notch, Electrically Welded, Nos. 3 and 4, ℔ doz. 50%
Grand Rapids All Steel Noiseless.. 50%
Niagara, No. 25, 1¾ in., 19¢; 2 in. ..... 20½¢
No. 26 Troy..1¾ in., 14½¢; 2 in., 16½¢
Star, No. 26....1¾ in., 19¢; 2 in., 20½¢
Tackle Blocks—See Blocks.

Pumps—
Cistern 60%
Pitcher Spout ..... 75&10&5@80
Wood Pumps, Tubing, &c 50%
Barnes Dbl. Acting (low list) 50%
Barnes Pitcher Spout 80%
Contractors' Rubber Diaphragm, No. 2, B. & L. Block Co. $16.00
Daisy Spray Pump ..... ℔ doz. $6.50
Flint & Walling's Fast Mail Hand (low list) ..... 50&5%
Flint & Walling's Fast Mail (low list) ..... 50&5%
Flint & Walling's Tight Top Pitcher 60%
National Specialty Mfg. Co., Measuring, Nos. 2, $6.00; 3, $5.50 ..... 30%
Myers' Pumps (low list) } 50%
Myers' Power Pumps ..... }
Myers' Spray Pumps ..... }

Pump Leathers—
Plunger and Valve Leathers—Per gro.:

No.....	1	2	3	4
	$5.00	6.00	7.00	8.00

Cup Leathers—Per 100:

Inch....	2½	3	3½	4
	$5.00	7.00	9.00	12.00

} 50&10&5%

Punches—
Saddlers' or Drive, good, doz. 50@75¢
Spring, single tube, good quality $1.75
Revolving (4 tubes) .... *doz.* $3.50
Remis & Call Co.'s Cast St'l Drive. 50%
Elmore Tool Mfg. Co.:
Machinists' Cover 40%
Tinners': Solid, 50%; Prick 50%
Morrill's Nos, 1AA, 1A, 1B, 1C, 1D, $15.00 ..... 50%
Hercules, 1 die, each $5.00 ..... 50%
Niagara Hollow Punches 40%
Niagara Solid Punches ..... 55&10%
Tinners' Hollow, P., S. & W. Co.. 40%
Tinners' Solid, P., S. & W. Co., ℔ doz., $1.44 ..... 40&10%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron, 2½@2¾¢
Sliding Door, Wrought Brass, 1⅛ in., lb., 36¢ 30%
Cronk's:
Double Braced Steel Rail..℔ ft. 2¾¢
O. N. T. Rail ..... 2¾¢
Griffin's:
xxx, ℔ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ℔ 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ℔ 100 ft. $3.45
O. N. T., ℔ 100 ft., 1 in., $3.12½; 1¼ in., $3.45; 1½ in., $4.00.
Standard, 1¼ in. ..... ℔ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., ℔ 100 ft., $7.50; 1¼ x 3-16 in., $8.75 ..... 55&7½%
Trolley, No. 301, ℔ ft. ..... 9¢
McKinney's:
Hinged Hanger Track, ℔ ft., 11¢ 60&5%
1 x 3-16 Track ..... 55&7½%
Myers' Stayon Track ..... 60&5%
Richards Mfg. Co.:
Common, 1 x 3-16 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail..60&10%
Lag Screw Rail, No. 65 ..... 50%
Gauge Trolley Track, ℔ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.
No. 50 ..... 60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
NOTE.—Many goods are sold at net prices.
American Fork & Hoe Co.:
Lawn, ℔ doz., No. 24, $2.50; No. 20 ..... $2.25
Cronk's:
Steel Garden: Champion, ℔ doz., 12-tooth, $3.75; 14-tooth, $4.00; 16-tooth, $4.25; Ideal, ℔ doz., 12-tooth, $3.00; 14-tooth, $3.30; 16-tooth, $3.60.
Victor, 12-tooth, $2.25; 14-tooth, $2.50; 16-tooth, $2.75.
Queen City Lawn, ℔ doz., 20 teeth, $2.85; 24, $3.00 ..... net
Anticlog Lawn, ℔ doz. $4.00
Malleable Garden ..... 70&10%
Ideal Steel Garden, ℔ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00 ..... 80%
Kohler's:
Jumbo Lawn, 36-tooth ..... ℔ doz. $5.00
Lawn Queen, 20-tooth ..... ℔ doz. $2.85
Lawn Queen, 24-tooth ..... ℔ doz. $3.00
Paragon, 20-tooth ..... ℔ doz. $2.65
Paragon, 24-tooth ..... ℔ doz. $2.75
Steel Garden, 14-tooth ..... ℔ doz. $2.40
Malleable Garden, 14-tooth, ℔ doz. $1.75@2.00

Rasps, Horse—
Disston's 75%
Heller Bros.' ..... 70&5@70&10&5%
Liveright Bros.' Gold Medal. 70&10@75%
McCaffrey's American Standard ..... 60&10&5%
New Nicholson ..... 70&10@75%
See also Files.

Razors—
John Engstrom Swedish 45%
Sharp Shaver 60%
Fox Razors, ℔ doz., No. 42, $24.00; No. 44, $20.00; No. 82, Platina, $36.00. } Discount 50%

Reels, Fishing—
Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo 20%
Aluminum, German Silv., Bronze. 25%
1240 N, 124 N 20%
3004 N, 06 N, 6 RM, G 9 ..... 25%
6 N 6 PN, 24 N, 26 PN 20%
2904 P., 33¼%; 2904 PN., 33¼%; 0024 N, 33¼%; 02084 N., 33¼%; 002904 PN, 33¼%; 802 N., 33¼%
986 PN, 2904 N, 974 PN 25%
5009 PN, 5009 N 20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR 20%
304 P, 304 PN, 00304 P, 00304 PN. 33⅓%

Registers—*List July 1, 1903.*
Japanned, Electroplated and Bronzed 70%
White Porcelain Enamel.. 50&10%
Solid Brass or Bronze Metal. 40%

Revolvers—
Single Action ..... $5¢@$1.00
Double Action, except 44 cal. $2.00
Double Action, 44 caliber... $2.00
Automatic $4.00
Hammerless $4.50

Riddles, Hardware Grade
16 in.....per doz. $2.50@$2.75
17 in.....per doz. $2.75@$3.00
18 in.....per doz. $3.00@$3.25

Rings and Ringers—
Bull Rings—

	1	2½	3 inch.
Steel	$0.70	0.75	0.80 doz.
Copper	$1.10	1.25	1.65 doz.

Hog Rings and Ringers—
Hill's Rings, per gro. boxes, $4.60@$4.75; per doz. boxes, 40@45¢
Hill's Ringers, Gray Iron, doz., 55@65¢
Hill's Ringers, Malleable Iron, doz. 85@95¢
Blair's Rings..per gro.$5.50@$6.00
Blair's Ringers..per doz.65@70¢

Rivets—
Copper Rivets and Burrs....50%
Tinners' and Miscellaneous Rivets ..... 80@80&10%

Bifurcated and Tubular—
Assorted in Pasteboard Boxes.
Bifurcated, per dozen boxes, 50 count, 40@45¢; 100 count, 50@63¢.
Tubular, per doz. boxes, 50 count, 60@68¢; 100 count, $1.12@$1.26.

Rollers—
Cronk's Stay, No. 50 ..... $1.00
Cronk's Brinkerhoff, No. 55, $0.60; No. 56, $0.75; No. 60 ..... $0.75
Lane's Stay 40%
Richards' Stay:
Handy Adj. and Reversible No. 53, 75¢
O. K. Adj. and Reversible No. 58, 50¢
Lag Screw, Nos. 55 and 57 ..... 50%
Underwriters', Nos. 59, 60 ..... 50%
Favorite, No. 51 ..... 60%

Rope—
Manila, 7-16 in. diam. and larger:
Pure ..... lb. 8¼@8½¢
Sisal, 7-16 in. diam. and larger:
Pure ..... lb. 6¾@7¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse:
Pure ..... lb. 7¼@7½¢
Sisal, Tarred, Medium Lath Yarn:
Pure ..... lb. 6¼@6½¢
Cotton Rope:
Best, ¼-in. and larger. 16½@18¢
Medium, ¼-in. and larger.15@16¢
Common, ¼-in. and larger.. 7½¢
In coils, ½¢ advance.
Jute Rope:
Thread, No. 1, ¼-in. and up, lb. ..... 6@6½¢
Thread, No. 2, ¼-in. and up, lb. ..... 5½@6¢

Wire Rope—
Galvanized ..... 47½&2½%
Plain ..... 55&2½%

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35%; Sisal 20%

Rules
Boxwood ..... 60&5%
Ivory ..... 25&5%
Chapin-Stephens Co.:
Boxwood 60%
Flexifold 40%
Ivory ..... 25@25&10%
Miscellaneous ..... 50@50&10%
Stephens' Combination 55%
Stationers' ..... 50@50&10%
Keuffel & Esser Co.:
Folding, Wood ..... 35&10%
Folding, Steel ..... 33⅓&10%
Lufkin's Steel ..... 50&10%
Lufkin's Lumber ..... 50&10%
Upson Nut Co.:
Boxwood ..... 60@60&10%
Ivory ..... 35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*
Sash Locks—See *Locks, Sash.*
Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—
Atkins':
Circular 45%
Band ..... 50@50&10%
Butcher Saws 50%
Cross Cuts 35%
One-Man Cross Cut 40%
Narrow Cross Cut 50%
Hand, Rip and Panel ..... 35&5%
Miter Box and Compass 40%
Mulay, Mill and Drag 45%
Wood Saws ..... 40&10%
Chapin-Stephens Co.:
Turning Saws and Frames. 30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws ..... 30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth. 50%
Band, 2 to 18 in. wide 60
Band, ¼ to 1¾ 60
Crosscuts 45
Narrow Crosscuts 50
Mulay, Mill and Drag 40%
Framed Woodsaws 25
Woodsaw Blades 25%
Woodsaw Rods, Tinned 15%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8 ..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30%
Compass, Key Hole, &c. 25%
Hand Ice Saws 45%
Butcher Saws and Blades 30%
C. E. Jennings & Co.'s:
Back Saws 16⅔%
Butcher Saws ..... 25&7½%
Compass and Key Hole Saws, 33⅓&7½%
Framed Wood Saws ..... 25&7½%
Hand Saws 12½%
Wood Saw Blades ..... 33⅓&7½%
Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Massachusetts Saw Works:
Victor Kitchen Saws ..... 40&10&50%
Butcher Saws Blades ..... 35@40%
Peace & Richardson's Hand Saws. 30%
Simonds':
Circular Saws 45%
Crescent Ground Cross Cut Saws. 30%
One-Man Cross Cuts ..... 40&10%
Gang Mill, Mulay and Drag Saws. 45%
Band Saws 50%
Back Saws ..... 25@25&7½%
Butcher Saws ..... 35@35&7½%
Hand Saws ..... 25@25&7½%
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c. .25@25&7½%
Wood Saws ..... 40&7½%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saw Blades and Frames—
Atkins' Hack Saw Blades A A A. .25%
Disston's:
Concave Blades 25%
Chromol Blades 35%
Hack Saw Frames 30%
Simonds, 25%; The Best, 35%; Culley 35%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180 ..... 40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades ..... 40&10%
Griffin's Hack Saw Frames. .35&5&10%
Griffin's Hack Saw Blades ..... 35&5&10%
Star Hack Saws and Blades ..... 15&10%
Sterling Hack Saw Blades. .30&10&5%
Sterling Hack Saw Frames. .30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00. .10%
Victor Hack Saw Blades 20%
Victor Hack Saw Frames 40%
Whitaker Mfg. Co.:
National Hand Blades, Hand Frames, Power Blades 40%

Scroll—
Barnes, No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $29 ..... 20%
Lester, complete, $10.00 ..... 15&10%
Rogers, complete, $3.50 and $4.00. . 15&10%

Scales—
Union Platform, Plain. $2.10@2.20
Union Platform, Stpd. $2.20@2.30
Chatillon's:
Eureka 25%
Favorite 40%
Grocers' Trip Scales 50%
The Standard Portables 40%
The Standard R. R. and Wag-

Scrapers—
Box, 1 Handle ..... doz. $1.85@2.10
Box, 2 Handle ..... doz. $2.35@2.50
Ship ... Light, $2.00; Heavy, $4.50
Chapin-Stephens Co., Box. .30@30&10%
Richards Mfg. Co., Foot 60%

Screws—Bench and Hand
Bench, Iron, doz., 1 in., $2.50@ 2.75; 1½, $3.00@3.25; 1¼, $3.50@3.75
Bench, Wood ..... 20@20&10%
Hand, Wood .... 70&10@70&10&10%
Chapin-Stephens Co., Hand ..... 70@70&10&2½%

Coach, Lag and Hand Rail—
Lag, Cone Point ..... 80&10%
Coach, Gimlet Point ..... 80&5%
Hand Rail ..... 70&10@75%

Jack Screws—
Standard List ..... 70&10@75%
Millers Falls ..... 50&10&10%
Swett Iron Works ..... 70@75%

Machine—
Cut Tread, Iron, Brass or Bronze:
Flat Head or Round Head, 50@50&10%
Fillister Head ..... 40@40&10%
Rolled Thread, F. H. or R. H., Iron ..... 75&10%
F. H. or R. H., Brass, Nos. 8 to 14 ..... 65&10%

Set and Can—
Set (Iron) ..... 75&10&7½%
Set (Steel), not advance over Iron 25%
Sq. Hd. Cap ..... 70&10&7½%
Hex. Hd. Cap ..... 70&10&7½%
Rd. Hd. Cap ..... 50&7½%
Fillister Hd. Cap ..... 60&7½%

Wood—
List July 23, 1903.
Flat Head, Iron .... 87½&5&..%
Round Head, Iron .... 85&5&..%
Flat Head, Brass .... 80&5&..%
Round Head, Brass .. 77½&5&..%
Flat Head, Bronze .... 75&5&..%
Round Head, Bronze. 72½&5&..%
Drive Screws ..... 87½&5&..%

Scroll Saws—
See *Saws, Scroll.*

Scythes—
Per doz.
Plain Grass, Cutting Edge Polished ..... $6.25@$6.50
Clipper, Bronzed Web. $6.50@$6.75
Solid Steel, Web and Backs Polished ..... $7.00@$7.25
Bush, Weed and Bramble, Painted ..... $6.50@$6.75
Grain, Painted, Cutting Edge Polished ..... $8.25@$8.50
Clipper Grain, Bronze Web. $8.50@$8.75

Seeders, Raisin—
Enterprise ..... 25@30%

Sets— Awl and Tool—
Fray's Tool Handles, Nos. 1, $12; 2, $16; 3, $12 ..... 50%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18. .20&10%

Garden Tool Sets—
American Fork & Hoe Co.:
Rake, Shovel and Hoe, ₱ doz. sets, No. 3 P F $7.25

Sets, Nail—
Octagon ..... gro. $3.50@3.75
Buck Bros. 27½%
Elmore Tool Mfg. Co. 30%
Mayhew's ..... ₱ gro. $9.00
Snell's Corrugated, Cup Pt. ..... 40&10%
Snell's Knurled, Cup Pt. ..... 40&10%
Victor Knurled, Cup Pt. ..... ₱ gro. $7.50

Rivet—
Regular list ..... 75@75&10%

Saw—
Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Triumph 30%
Giant Royal Cross Cut. ..... ₱ doz. $7.50
Morrill's No. 1 ..... $15.00
Nos. 3 and 4, Cross Cut. $20.60
No. 5, Mill $30.00
Nos. 10, 11, 95 ..... $15.60
No. 1 Old Style $10.00
Special $16.25
Royal, Hand ..... ₱ doz. $4.50
Seymour Smith & Son's 65%
Taintor Positive ..... ₱ doz. $6.75

Shaving—
Fox Shaving Sets, No. 30 .....
₱ doz., net, $24.00
Smith & Hemenway Co.'s 75%

Sharpeners, Knife—
Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ₱ doz. $1.50
Mounted Kitchen Sand Stone, ₱ doz. $1.50
Natural Grit Carving Knife Hones, ₱ doz. $3.00
Quick Cut Emery Carving Knife Hones, ₱ doz. $1.50
Quick Edge Pocket Knife Hones, ₱ doz. $2.50
} 50%

Skate—
Smith & Hemenway Co., Eureka. .50%

Shaves, Spoke—
Iron ..... doz. $1.25
Wood ..... doz. $2.00
Chapin-Stephens Co. ..... 30@30&10%
Goodell's ₱ doz. $9.00 ..... 15&10%
Seymour Smith & Son's 50%

Shears—
Cast Iron..	7	8	9 in.
Best ...	*$16.00*	*18.00*	*20.00 gro.*
Good ...	*$13.00*	*15.00*	*17.00 gro.*
Cheap ..	*$5.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality Jap ..... 70&10&5%
Best Quality Nickel. .60&10&5%
Tailors' Shears ..... 40@40&10%
Acme Cast Shears ..... 40@40&5%
Columbian Cutlery Co.:
Sheep, 1900 list ..... 30&10&5%
Grass ..... 50&10%
Horse or Mule ..... 50&10%
W. H. Compton Shear Co.:
Japan Handles, Nickel Blades, 60&10&5%
Full Nickel ..... 50&10&5%
Heinisch's Tailor's Shears 10%
National Cutlery Co.'s Nickel Plated. 60&10%; Japan Handles ..... 70&10%
J. Wiss & Sons Co.:
Best Quality Jap'd ..... 60&10%
Best Quality Nickeled ..... 50&10%
Tailors' 25%

Tinners' Snips—
Steel Blades ..... 20&5@20&10%
Steel Laid Blades ..... 50&10%
Acme Cast Snips ..... 40@45&5%
W. H. Compton Shear Co., Forged Steel Handles 35%
Forged Handles, Steel Blades, Berlin 50%
Heinisch's Snips 40%
Jennings & Griffin Mfg. Co.'s 6½ to 10 in. ..... 33⅓&7½%
National Cutlery Co.'s Forged Steel. 50%
Niagara Snips 40%
P. S. & W. Forged Handles, 25%; W. R. W. 50%
J. Wiss & Sons Co.:
Wiss Forged Steel 25%

Pruning Shears—
Columbian Cutlery Co.:
Hedge, Wilcut Braud ..... 60&10%
Lawn and Border, Wilcut Brand, 60&10%
W. H. Compton Shear Co., Dropped Forged Steel 35%
Cronk's Hand Shears 33⅓%
Cronk's Wood Handle Shears. 33⅓%
Disston's Combined Pruning Hook and Saw, ₱ doz. $18.00 ..... 25%
Disston's Pruning Hook only, ₱ doz., $12.00 ..... 25%
J. T. Henry Mfg. Co.:
Pruning Shears, all grades 40%
P. S. & W. Co. ..... 40&10%
Seymour Smith & Son's:
Hand Shears 70%
Standard Tree Pruners ..... 75&10%
Wood Handle Pruning Shears. 40%

Sheaves—Sliding Door—
Reading 40%
R. & E. list 15%

Sliding Shutter—
Reading list 40%
R. & E. list 15%

Shells—Shells, Empty—
Brass Shells, Empty:
Climax, 10 and 12 gauge ..... 60&5%
Club, Rival, 65&5%; First Quality, 60&5%
Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge, 25&10%
Climax, 10 and 12 gauge; Acme and Magic, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade ..... 25&5%
Union, League, 10 and 12 gauge, Rival Grade 25%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge 20%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade. .20%

Shells, Loaded—
Loaded with Black Powder. .40%
Loaded with Smokeless Powder, medium grade ..... 40&5%
Loaded with Smokeless Powder, high grade ..... 40&10&10%
Union Metallic Cartridge Co.:
New Club, Black Powders 40%
Nitro Club, Smokeless Powders. 40&5%
Arrow, Smokeless Powders. 40&10&10%
Winchester:
Smokeless Repeater Grade ..... 40&5%
Smokeless Leader Grade. ..40&10&10%
Black Powder 40%

Shingles, Metal— Per Sq.
Edwards Mfg. Co.:

	Painted.	Galv.
14 x 20	$4.25	$6.00
10 x 14	4.50	6.25
7 x 10	4.75	6.50

Wheeling Corrugating Co.:

Dixie, 14 x 20 in.	$4.05	$5.05
Dixie, 10 x 14 in.	4.25	5.45
Dixie, 7 x 10 in.	5.25	6.70

Shoes, Horse, Mule, &c.—
F.o.b. Pittsburgh:
Iron ..... per keg. $4.10
Steel ..... per keg. $3.85
Burden's, all sizes ..... ₱ keg $3.90

Shot—
25-lb. bag.
Drop, up to B $1.70
Drop, B and larger 1.95
Buck 1.95
Chilled 1.95
Dust 2.30

Shovels and Spades—
Association List. .40&7½@40&10%
Avery Stamping Co. 40%

Snow Shovels—
Long Handle ..... $2.50@$2.75
Wood and Mall, D Handle. $2.65@$2.90

Sieves and Sifters—
Hunter's Imitation, gro. $9.50
Hunter's Genuine, per gro. .$12.00

Sifters, Ash—
Acme Ball Bearing Sales Co., Acme Automatic Ash Sifter, each, $3.25; ₱ doz. $39.00

Sieves, Seamless Metallic
—Per dozen.—

*Mesh ..... *	*1½*	*16*	*18*	*20*
Iron Wire... $1.05	*1.05*	*1.10*	*1.20*	
Tinned Wire. $1.15	*1.15*	*1.20*	*1.30*	

Sieves, Wooden Rim—
Nested, 10, 11 and 12 Inch.
Mesh 18, Nested .... doz. $0.90@0.95
Mesh 20, Nested .... doz. $1.00@1.05
Mesh 24, Nested .... doz. $1.30@1.40

Sinks, Cast Iron—
Painted, Standard list:
12 x 12 to 22 x 36 in. 60%
20 x 24 to 24 x 50 in. 50%
24 x 60 to 24 x 120 in. 30%
Barnes' low list 60%

NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—
Cast Iron ..... 70@70&10%
Steel ..... 35@40%

Slates, School—
Factory Shipments.
"D" Slates ..... 50@50&10%
Eureka, Unexcelled Noiseless.. 60&7 tens.
Victor A, Noiseless. 60&4 tens 45%

Slaw Cutters—See *Cutters.*

Snaps, Harness—
German ..... 40@40&10%
Covert Mfg. Co.:
Derby, 25%; Yankee, 30&2%; Yankee Roller, 30&2%
High Grade, 40%; Trojan 40%
Jockey 25%

Snaths—
Grass Scythe ..... 50@50&5%

Snips, Tinners—See *Shears.*

Spoons and Forks—
Silver Plated—
Good Quality ..... 50&10@60&5%
Cheap ..... 60@60&10%
International Silver Co:
1847 Rogers Bros. ..... 40&10%
Rogers & Bro., William Rogers' Eagle Brand ..... 50&10%
Anchor, Rogers Brand 60%
Wm. Rogers & Son ..... 60&10%
Miscellaneous
German Silver ..... 60@60&5%
Tinned Iron—
Teas ..... per gro. 50@55¢
Tables ..... per gro. $0.90@$1.00
Atlas Mfg. Co.:
Tea Spoons, ₱ gro. ..... 50¢@55¢
Table Spoons, ₱ gro. ..... $0.90@$1.00

Springs— Door—
Bardsley's Spring and Check 40%
Chicago (Coil) ..... 40&10%
Gem (Coil) 20%
Pullman Door and Gate 10%
Reliance (Coil) ..... 40&10%
Star (Coil) 35%
Torrey's Rod, 39 in. ..... ₱ doz. $1.00

Carriage, Wagon, &c.—
1¼ in. and Wider:	*Per 100 lb.*
Black	*$4.75@$5.00*
Half Bright	*$4.75@$5.00*
Bright	*$5.25@$5.50*

Painted Seat Springs:
1½ x 2 x 26 .... per pair. 45@47¢
1½ x 3 x 28 .... per pair. 68@71¢

Sprinklers, Lawn—
American Foundry & Mfg. Co.:
Cactus, 65%; Japanese, 70%; National, ₱ doz. $12.00
Enterprise ..... 25@30%
Hero Fruit Jar Co., ₱ doz. $4.50
Philadelphia No. 1, ₱ doz. $12; No. 2, $15; No. 3, $20 ..... 30%

Squares—
Nickel plated.. } List Jan. 5, 1900.
Steel and Iron. } 80@—%
Rosewood Hdl. Try Square and T-Bevels ..... 60&10&10@70%
Iron Hdl. Try Squares and T-Bevels ..... 40&10@40&10&10%
Disston's Try Squares and Bevels, 60&10%

Squeezers, Lemon
Wood, Porcelain Lined:
Cheap ..... doz. $1.00
Good Grade ..... doz. $1.25
Tinned Iron ..... doz. $0.75@1.00
Iron, Porcelain Lined ... doz. $1.75
Victor, ₱ gro. $9.00

Staples—
Barbed Blind ..... 85&5@85&10%
Electricians' ..... 80&10&10@85%
Fence Staples, Polished, $2.05; Galvanized $2.35
Poultry Netting Staples ..... per lb. 3½@3½¢

Steels, Butchers'—
Dick's 30%
Foster Bros. 30%

Steelyards— .... 30@30&10%

Stocks and Dies—
Blacksmiths' ..... 50@50&10%
Curtis Rev'ble Ratchet Die Stock. .25%
Derby Screw Plates 25%
Green River 25%
Lightning Screw Plate 25%
Little Giant 25%
Reece's New Screw Plate 25%

Stoners, Cherry—
Enterprise ..... 25@30%

Stones, Axe—
Pike Mfg. Co., Axe Stones (all kinds) 33⅓%

Glass Cutters' Stones—
Pike Mfg. Co., Glass Cutters' Stones and Supplies 40%

Stones, Oil, &c.—
Pike Mfg. Co., 1907 list: ₱ lb.
Arkansas St. No. 1, 3 to 5½ in. $2.80
Arkansas St. No. 1, 5½ to 8 in. $3.50
Arkansas Slips No. 1 ..... $1.00
Lily White Washita, 4 to 8 in. 60¢
Rosy Red Washita, 4 to 8 in. .60¢
Washita St., Extra, 4 to 8 in. .50¢
Washita St., No. 1, 4 to 8 in. .40¢
Washita St., No. 2, 4 to 8 in. .25¢
Lily White Slips ..... 90¢
Rosy Red Slips ..... 90¢
Washita Slips, Extra ..... 80¢
Washita Slips, No. 1 ..... 70¢
Washita Slips, No. 2 ..... 40¢
India Oil Stones (entire list). .33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit 40%
Quickcut Emery and Corundum Axe Stone, Double Grit 33⅓%
Quickcut Emery Rubbing Bricks. 40%
Hindostan No. 1, R'g'lar. ₱ lb 8¢
Hindostan No. 1, Small. ₱ lb 10¢
Turkey Oil Stones, Extra, 5 to 8 in. ..... ₱ lb 80¢
Queer Creek Stones, 4 to 8 in. 20¢
Queer Creek Slips ..... 40¢
Sand Stone ..... 6¢

} 33⅓%

Scythe Stones—

Pike Mfg. Co., 1907 list:
Black Diamond S. S. ₱ gro. $12.00
Lamoille S. S. ₱ gro. $11.00
White Mountain S. S. ₱ gro. $9.50
Green Mountain S. S. ₱ gro. $7.00
Extra Indian Pond S. S. ₱ gro. $8.00
No. 1 Indian Pond S. S. ₱ gro. $7.50
No. 2 Indian Pond S. S. ₱ gro. $5.00
Leader Red End S. S. ₱ gro. $5.00
Quick Cut Emery.... ₱ gro. $10.00
Pure Corundum..... ₱ gro. $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat. $8.80
Emery Scythe Rifles, 3 Coat. $11.00
Emery Scythe Rifles, 4 Coat. $13.20
Balance of 1907 list 33⅓%.
Lectro (Artificial), ₱ gro., $12.00 33⅓%
$12.00 ..... 33⅓%
Lightning (Artificial), ₱ gro. $18.00 ..... 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers..... ₱ gro. $9.00

Stops— Bench—

Millers Falls..... 15&10%
Morrill's, ₱ doz., No. 1, $10.00.... 50%
Morrill's, No. 2, $12.50..... 50%
Seymour Smith & Son's..... 60%

Door—

Chapin-Stephens Co..... 50@50&10%

Plane—

Chapin-Stevens Co..... 20%

Straps— Box—

Acme Embossed, case lots..20&10&10%
Cary's Universal, case lots...20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points..doz.55¢
All Steel Socket...doz.$2.00@2.25
Excelsior Stretcher and Tack Hammer Combined, ₱ doz., $6.00....20%

Stuffers, Sausage—

Enterprise Mfg. Co., Stuffers and Lard Presses..... 25@25&7½%
National Specialty Co., Hat Jan. 1, 1902 ..... 30&5%
P., S. & W. Co..... 40&10&5%

Sweepers, Carpet—

Goshen Sweeper Co.:	Per doz.
Gilt Edge	$27.00
Superfine	26.00
Majestic	24.00
Select, Nickeled	22.00
National Sweeper Co.:	
National Queen, Nickeled	$27.00
Martha Washington, Nickeled	25.00
Monarch, Japanned	20.00
Perpetual, Japanned	18.00
Streator Metal Stamping Co.:	
Model E, Sanitaire	$25.00
Eureka	15.00
Streator Majestic, Nickeled	24.00
Streator Conqueror, Japanned	22.00

NOTE.—Leading Manufacturers give the following rebates from list prices: 50c per dozen on three-dozen lots: $1 per dozen on five-dozen lots; $2 per dozen on ten dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks.90&25@—%
American Cut Tacks..90&25@—%
Swedes' Cut Tacks.L..90&30@—%
Swedes' Upholsterers'.90&35@—%
Gimp Tacks.....90&35@—%
Lace Tacks.....90&35@—%
Trimmers' Tacks.....90&30@—%
Looking Glass Tacks.....65@—%
Bill Posters' and Railroad Tacks, 90&40@—%
Hungarian Nails.....80@—%
Finishing Nails.....70@—%
Trunk and Clout Nails.75&5@—%

NOTE.—The above prices are for Straight Weights.

Miscellaneous—

Double Pointed Tacks, 90&6 tens@—%
Se also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.:		
Gal.	Gasoline	Oil
50	$2.75	$3.00
60	$3.50	$4.00
110	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin....50@—%
Patent Leather.....25@30&5%
Steel .....33⅓&5%
Chesterman's .....25@25&5%
Keuffel & Esser Co.:
Favorite, Ass Skin.....40&10@50%
Favorite, Duck and Leather..... 25&5@25&10%
Metallic and Steel, lower list, 35@ 35&5%; Pocket, 35@35&5%.
Lufkins:
Asses' Skin..... 40&10@50%
Metallic ..... 30@30&5%
Patent Bend, Leather...25&5@25&10%
Pocket ..... 40@40&5%
Steel ..... 33⅓@33⅓%
Wiebusch & Hilger:
Chesterman's Metallic, No. 34L. etc. 25%
Chesterman's Steel, No. 1038L. etc. 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ¾-inch and larger per 100 lb.....$2.55@$2.80

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c.....30@35%

Ties, Bale—Steel Wire—

Single Loop.....82½&10%
Monitor, Cross Head, &c.70&2½%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White..... 20@20&5%

Haying—

Myers' Hay Tools..... 50%

Ice Tools—

Gifford-Wood Co..... 15%

Miniature—

Smith & Hemenway Co.'s, Davidson, ₱ doz., Nickel Plated, $1.50; Gold Plated..... $2.00

Saw—

Atkins' Cross Cut Saw Tools....35&5%
Simond's Improved..... 33⅓%
Simonds' Crescent..... 30%

Ship—

L. & I. J. White..... 25%

Torches—

Hammers, Engine, ₱ doz..... $4.50

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz., $1.15@$1.25; gro.....$11.50@12.00
Harper, Champion or Paragon, doz., $1.25@1.40; gro.$13.00@13.50

Game—

Imitation Oneida.....75@10%
Newhouse ..... 50&5%
Hawley & Norton..... 65&10%
Victor ..... 75@75&10%
Oneida Community Jump..... 70&5%
Stop Thief..... 60%
Tree Trap..... 60%
Hector ..... 75@75&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes, 12¢
Mouse, Round or Square Wire, doz.85@90¢
Marty French Rat and Mouse Traps (Genuine), ₱ doz.:

Crate lots.	Small lots.
No. 1, Rat..... $11.50	$14.50
No. 3, Rat..... 5.75	6.50
No. 3½, Rat..... 4.70	5.25
No. 5, Mouse..... 2.25	3.00

Animal Trap Co.:
Out o' Sight, Mouse, ₱ doz.....$0.60
Out o' Sight, Rat, ₱ doz..... 1.20
Easy Set, Mouse, ₱ doz..... .35
Easy Set, Rat, ₱ doz..... .85
Out o' Sight Chockers, ₱ doz. holes ..... .12
Out o' Sight, Tin, 5-hole, ₱ doz. traps ..... .75

Trowels—

Disston Brick and Pointing..... 25%
Disston Plastering..... 20%
Disston "Standard Brand" and Garden Trowels..... 30%
Kohler's Steel Garden Trowels, ₱ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break, Forged Steel Garden Trowels, in bulk, net ₱ gro. $5.50
In 1 doz. boxes..... ₱ gro. $6.00
Woodrough & McParlin, Plastering..25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern..... 50&10%
Western Pattern..... 60&10%
Handy Trucks..... ₱ doz. $16.00
Grocery ..... ₱ doz $15.00
McKinney Trucks..... each, net $10.00
Model Stove Trucks..... ₱ doz $18.50

Tubs, Wash—

M'f'gr's list, price per gross.

No.	0	1	2	3
Galvanized.	$67	$79	$91	$103

10&7½ &5&5%

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls..21@23¢
No. 12, ¼ and ½-lb. Balls..19@21¢
No. 18, ¼ and ½-lb. Balls..16@18¢
No. 24, ¼ and ½ -lb. Balls. 15½@17½¢
No. 36, ¼ and ½-lb. Balls..15@17¢
Chalk Line, Cotton ¼-lb. Balls .....24@29¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz.....8½@19¢
Cotton Wrapping, 5 Balls to lb., according to quality..13½@19¢
American 3-Ply Hemp, ¼ and ½-lb. Balls.....12½@18¢
American 3-Ply Hemp, 1-lb Balls .....13¼@16¢
India, 3-Ply Hemp, 1½-lb. Balls, Balls (Spring Twine)...7½@9¢
India 3-Ply Hemp, 1-lb. Balls 7½@9¢
India 3-Ply Hemp, 1½-lb. Balls, 7@8½¢
2, 3, 4 and 5-Ply Jute, 1½-lb. Balls .....9@11¢
Mason Line, Linen, ½-lb. Bls.17¢
No. 26½ Mattress, ¼ and ½ lb. Balls, according to quality. 50@60¢
Wool, 3 to 6 ply....B 6¢; A 7½¢

Vises—

Solid Box.....60@60&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable..... 40%
Standard 40%
Amateur 25%
Columbian Hdw. Co., Slide ..... 40&5%; 65%
Fisher & Norris Double Screw, net, each Nos. 2 $10.50; 3 $16.00; 4, $20.50; 5, $27.00; 6, $32.00.
Fulton Mach. & Vise Co.:
F. & R. Double Swivel Machinists' 40%
Star, Solid Jaw, Machinists'..... 40%
Hollands':
Machinists' ..... 40@40&5%
Keystone ..... 65&5@70%
Lewis Tool Co.:
Adjustable Jaw..... 30%
Monarch, 50%; Solid Jaw..... 50%
Massey Vise Co.:
Clincher 40%
Parallel Bar..... 15%
Perfect, 15%; Lightning Grip..... 15%
Merrill's 25%
Millers Falls Oval Slide Pattern. 60&10%
Parker's:
Victor, 20@25%; Regulars....20@25%
Vulcan's ..... 40@45%
Combination Pipe..... 55@60%
Prentiss ..... 20@25%
Rock Island..... 25%
Snediker's X. L..... 33⅓%
Stephens' 33⅓%

Saw Filers

Disston's D 5 Clamp and Guide, ₱ doz., $24.00, 30%; Clamps..... 30%
Perfection Saw Clamps, ₱ doz....$1.50
Reading 60%

Wood Workers—

Fulton Mach. & Vise Co.:
F. & R. Double Swivel Coachman's 40%
Star Solid Jaw Woodworkers'.... 60%
Massey Vise Co.:
Lightning Grip, 15%; Perfect....15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Fulton Machine & Vise Co., Combination Pipe..... 70%
Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe..... 40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 870, 40%.
Rock Island Pipe..... 25%

Wads—*Price per M.*

B. E., 11 up.....60¢
B. E., 9 and 10.....70¢
B. E., 8.....80¢
B. E., 7.....80¢
P. E., 11 up.....$1.00
P. E., 9 and 10..... 1.25
P. E., 8..... 1.50
P. E., 7..... 1.50
Ely's B. E., 11 and larger.$1.70@1.75
Ely's P. E., 12 to 20....$3.00@3.25

Dis. 15%

Ware, Hollow—

Cast Iron, Hollow—

Store Hollow Ware:
Enameled .....45&10%
Ground .....50&5%
Plain or Unground.....60%
Country Hollow Ware, per 100 lbs .....$2.75@$3.00
White Enameled Ware:
Muslin Kettles.....65&10%
Covered Wares:
Tinned and Turned.....35&10%
Enameled .....45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware..... 33⅓%
El-an-ge..... 60&10%
Iron Clad Ware..... 70&10%
Lava and Volcanic, Enameled..40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	45¢	50¢	55¢	65¢

Steel Hollow Ware—

Avery Stamping Co.:
Never-Break Spiders and Griddles ..... 65&10%
Steel Kettles, Muslins Scotch Bowls, Tin'd..... 60%
Steel Stew Pans, Stew Pots, etc., Porcelained 50%
Cleveland Stamping & Tool Co.:
Solid Steel Spiders and Griddles ..... 65&5%
Solid Steel Kettles..... 60&5%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

No.	₱ doz.
800—Brass King, Single Surface, Open Back	$2.80
862—White Hen, Spiral Grimp Glass	$3.35
964—Royal Blue Enamel, Single Surface, Ventilated Back	$3.35
172—Our Best, Single Zinc, Soap Drainer	$3.35
722—Soap Saver, Single Zinc, Iron Top	$3.35
100—Northern Queen, Single Zinc, Perforated, Open Back	$3.00
134—Universal, Single Zinc, Extra Family Size, Ventilated Back	$2.80
760—Banner Globe, Single Zinc, Ventilated Back	$2.25
57—Peerless, Double Zinc, Spring Protector	$3.70
56—Red Cross, Double Zinc, Swing Protector	$3.60
17—North Star, Solid Zinc, Swing Protector	$3.60
797—Jewel, Single Zinc, Pail Size.	$1.25
St. Louis Washboard Co. Ben Hur, Brass, Open Back	$2.50
Brass Key, Open Back	$2.75

Washers—Leather, Axle—

Solid .....90@90&10%
Patent .....90@90&5%
Coil; ¾ 1 1¼ 1¼ inch. 9¢ 10¢ 11¢ 14¢ per box.

Iron or Steel—

Size bolt.... 5-16 ¾ ½ ⅝ ¾
Washers.... $1.90 1.00 2.70 2.50 2.30
The above prices are based on $6.50 off list.

In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.
Avery Stamping Co.:
Standard, in 200 lb kegs, $6.00 ₱ 100 lb. discount; in 100 lb kegs, add 10¢ net ₱ 100 lb; in 5 or 10 lb boxes, add 50¢ net ₱ 100 lb; in 1 lb boxes, add $1.00 net ₱ 100 lb.

Cast Washers—

Over ½-inch, barrel lots, per lb. 1½@1¾¢

Wedges—

Oil Finish.....lb., 2¼@2¾¢

Weights—Hitching—

Covert Mfg. Co..... 30&2%

Sash—

Per net ton.....$22.50@—

Wheels, Corundum and Emery—

Pike Mfg. Co., Corundum, 65%; Emery 75%

Well—

8-in., $2.00; 10-in., $2.30; 12-in., $3.00; 14-in., $4.45.

Wire and Wire Goods—

Bright and Annealed:
6 to 9.....72&10&7½%
10 to 18.....72½&10&10%
19 to 26.....75&10&10&2½%
27 to 36.....77½&10&7½%
Galvanized:
6 to 9.....72½&10%
10 to 14.....72½&10&5%
15 to 16.....72½&10&5%
17 to 18.....72½%
19 to 26.....70&5&2½%
27 to 36.....65&10&10%
Coppered:
6 to 9.....65&10&10%
10 to 14.....70&10&5%
15 to 18.....65&10&10&0%
19 to 26.....70&5&2½%
27 to 36.....72½&10&2½%
Tinned:
6 to 18.....67&10&10%
Brass.....15¾¢ lb., base
Copper.....15¼¢ lb., base
Cast Steel Wire.....50%

Spooled Wire—

Annealed and Tinned.75@75&10%
Brass and Copper....70@70&10%
Retailers' Assortments, per box, $1.90@$2.10
Wire Clothes Line. See Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods.....90&10%
Brass Wire Goods.....90&10%
Brass Cup and Shoulder Hooks, 85%

Wire Cloth and Netting—

Galvanized Poultry Netting, 80&10@80&10&5%
Screen Cloth, 12 Mesh, per 100 sq. ft.; Painted, $1.35; Galvanized, $1.95; 14 Mesh, Bronze $6.50.
Standard Galv. Hardware Grade: 100 ft. rolls, 2½ to 48 in. wide, Per 100 sq. ft.
Nos. 2, 2½ and 3 Mesh....$2.75
Nos. 4 and 5 Mesh.....$3.00
No. 6 Mesh.....$3.25
Nos. 7 and 8 Mesh.....$3.75

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural ....80&10@80&10&5%
Alligator or Crocodile.70&10@75%
Baxter Pattern S Wrenches, 70&5@70&10%
Drop Forged S.....45@45&5%
Acme ..... 60&10%
Alligator Pattern, 70%; Bull Dog..70%
Bemis & Call's:
Adjustable S, 40&5%; Adjustable S Pipe, 40&5%; Briggs Pattern, 40%; Combination Bright, 50%.
Steel Handle Nut..... 50&5%
Combination Black..... 50&5%
Merrick Pattern..... 50&5%
Boardman's 40%
Coes' Genuine Knife Hdl...40&10&5&5%
Coes' Genuine Steel Hdl...40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes' Genuine Hammer Handle..... 40&10&5&5%
Coes' "Mechanics'"...40&10&10&5&5%
Donohue's Engineer..... 40&10%
Eagle 70%
Gem Pocket..... 30%
Hercules 70%
W. & B. Machinist:
Case lots..... 50&10%
Less than case lots..... 50%
W. & B. Railroad Special:
Case lots..... 50%
Less than case lots..... 40&10&5%
Solid Handles, P., S. & W...50&10%; full cases..... 50&10&5%
Standard Nipple Mfg. Co.:
Duplex Chain..... 50%
Uwanta Wrench Co.:
Uwanta Special, Iron Handle.... 40&10&5%
Other Wrenches..... 50%
Vulcan and Agrippa Chain..... 50%
Whitaker Machinists'..... 50&10%
Wizard Adjustable Ratchet..... 50%

Fruit Jar—

Bent, P. Forbes, Triumph, ₱ gro., $7.50; per doz..... $0.90

Wrought Goods—

Staple Hooks, &c., list March 17, '02.....90@—%

Zinc— (*Cask lots at mill.*)

Sheet.....per 100 lb., $6.75